INVITATION FOR BID

Construction

B24-057CA

Date issued: April 16, 2024

BARNES OUTFALL POND

THE CITY OF COLORADO SPRINGS

Contact:
Crystal Abeyta
Procurement Services, City of Colorado Springs
719-385-5274
crystal.abeyta@coloradosprings.gov

The City of Colorado Springs hereby solicits Fixed Unit Price (FUP) Bid, as detailed in this Invitation For Bids (IFB), for B24-057CA Construction of the Barnes Outfall Water Quality Pond.

This IFB is posted to BidNet Direct and the City of Colorado Springs' Procurement Services Website. It is available for all vendors free of charge, following free registration, at the BidNet Direct website.

SUBMITTALS FOR THIS PROJECT WILL ONLY BE ACCEPTED ON THE BIDNET DIRECT PLATFORM.

Please login to the following website to register (Free Registration) to submit a bid for this project. All required documents will be uploaded to the BidNet website. The City of Colorado Springs belongs to BidNet's Rocky Mountain e-Purchasing Group within BidNet.

https://www.bidnetdirect.com/

BIDNET Direct Support

800-835-4603

Estimated Project Magnitude: $3,500,000 - $3,800,000

SECTION I – BID INFORMATION

1.0 BID INFORMATION

Section I provides general information to potential Bidders, such as bid submission instructions and other similar administrative elements. This Invitation for Bid (IFB) is available on BidNet (www.bidnetdirect.com). All addenda or amendments shall be issued through BidNet and may not be available through any other source.

1.1 SPECIAL TERMS

Please note the following definitions of terms as used herein:

The term "City" means the City of Colorado Springs.

The term "Contractor" or "Consultant" means the Bidder whose offer is accepted and is awarded the contract to provide the products or services specified in the IFB.

The term "Offer" or "Bid" means a bid submitted in response to this IFB.

The term "Offeror" or "Bidder" means the person, firm, or corporation that submits a formal bid or offer and that may or may not be successful in being awarded the contract.

The term "Project" refers to Barnes Outfall Pond Project.

The term "Invitation for Bid" or "IFB" means this solicitation of formal, competitive, sealed bids from prospective bidders in which the intent is to award a contract to the resultant lowest responsible and responsive bidder.

1.2 BID ISSUE DATE

Invitation for Bid (IFB) Number B24-057CA is being issued and posted on www.bidnetdirect.com on April 16, 2024.

1.3 SUBMISSION OF BIDS

A. Bids are to be submitted electronically on BidNet Direct (www.bidnetdirect.com). Please review the submission requirements **well in advance** of submission date and time, and allow for ample time to upload each required document. It is recommended that Offerors begin the submission process at least one (1) day in advance of the proposal deadline.

   Offerors are solely responsible to ensure all required bid documents are uploaded and submitted correctly, and that a **confirmation number** is obtained upon successful submission. Customer support for BidNet Direct may be reached at (800) 835-4603.

B. Bids shall be received on or before: Thursday, May 16, 2024 no later than **3:00PM** MST. A public opening will be held via Microsoft Teams at that time. Web access and dial in information is below:

Microsoft Teams Need help?

Join the meeting now

Meeting ID: 296 984 897 665
Passcode: Y8bwZg

Dial-in by phone
+1 720-617-3426,,523998898# United States, Denver
Find a local number
Phone conference ID: 523 998 898#

C. Bid bond is required if total bid exceeds $50,000.00. (Also see 1.22)

D. The cost of Bid preparation is not a reimbursable cost. Bid preparation shall be at the Bidder's sole expense and is the Bidder's total and sole responsibility.

1.4 PRE-BID CONFERENCE

A pre-bid meeting will be held via Microsoft Teams on Tuesday, April 23, 2024 at 11:00AM MST. This meeting is highly encouraged but not mandatory. Log in information is below:

Microsoft Teams Need help?

Join the meeting now

Meeting ID: 247 181 661 402
Passcode: oicYQD

Dial-in by phone
+1 720-617-3426,,733856826# United States, Denver
Find a local number
Phone conference ID: 733 856 826#

1.5 LATE BIDS/LATE MODIFICATIONS OF BIDS

Bids, withdrawals or modifications of Bids received after the time set for opening, as designated in 1.3 above, are considered "late bids", and will not be accepted by the City, except as provided for in the City of Colorado Springs Procurement Rules and Regulations and approved by the Procurement Services Manager. Bidders are solely responsible for insuring their bids arrive on time and to the place specified in this Invitation for Bid.

1.6 MISTAKES IN BIDS - CONFIRMATION OF BID

If it appears from a review of a Bid that a mistake has been made, the Bidder may be requested to confirm its Bid in writing. Situations in which the confirmation may be requested include obvious, apparent errors on the face of a Bid or a Bid unreasonably lower than the other Bids submitted. All mistakes in Bids will be handled in accordance with the City of Colorado Springs Procurement Rules and Regulations**.**

1.7 PROCUREMENT RULES AND REGULATIONS

All formal IFBs advertised by the City of Colorado Springs are solicited in accordance with the City's Procurement Rules and Regulations. The City's Procurement Rules and Regulations can be reviewed and/or downloaded from the City's Procurement Services Division website at www.coloradosprings.gov. Any discrepancies or conflicting statements, decisions regarding bidding irregularities, or clarifications regarding clauses or specifications will be rectified utilizing the City's Procurement Rules and Regulations, when applicable. It is the Bidder's responsibility to advise the Contracts Specialist listed in this IFB of any perceived discrepancies, conflicting statements, or problems with clauses or specifications prior to the Bid opening date and time.

1.8 MINOR INFORMALITIES/IRREGULARITIES IN BIDS

A. A minor informality or irregularity is one that is merely a matter of form and not of substance. It also pertains to some immaterial defect in a Bid or variation of a Bid from the exact requirements of the invitation that can be corrected or waived without being prejudicial to other Bidders. The defect or variation is considered immaterial when the effect on price, quantity, quality, or delivery is negligible when contrasted with the total cost or scope of the goods and/or services being acquired.

B. If the City Procurement Services Division determines that a Bid submitted contains a minor informality or irregularity, then the Procurement Services Manager shall either give the Bidder an opportunity to cure any deficiency resulting from the minor informality or irregularity or waive the deficiency, whichever is to the advantage of the City. In no event will the Bidder be allowed to change the Bid amount. Examples of minor informalities or irregularities include but are not limited to the following:

    1. Bidder fails to sign the Bid, but only if the unsigned Bid is accompanied by other material evidence, which indicates the Bidder's intention to be bound by the unsigned Bid (such as Bid security, or signed cover letter which references the Bid Number and amount of Bid).
    2. Bidder fails to acknowledge an Amendment, although this may be considered a minor informality only if the Amendment, which was not acknowledged, involves only a matter of form or has either no effect or merely a negligible effect on price, quantity, quality, or delivery of the item or services bid upon.

1.9 REJECTION OF BIDS

The Procurement Services Manager has the authority to reject any Bid based on, but not limited to, the following:

A. Any Bid that fails to conform to the essential requirements of the Invitation for Bids shall be rejected.

B. Any Bid that does not conform to the applicable specifications shall be rejected unless the IFB authorizes the submission of alternate bids and the items or services offered as alternates meet the requirements specified in the IFB.

C. A Bid that fails to conform to the specified delivery schedule.

D. A Bid shall be rejected when the Bidder imposes conditions that would modify requirements of the IFB or limit the Bidder's liability to the City, since to allow the Bidder to impose such

conditions would be prejudicial to other Bidders.

For example, Bids shall be rejected in which the Bidder:

1. Protects against future changes in conditions, such as increased costs, if total possible costs to the City cannot be determined. This includes failure to completely fill out required bid schedule.
2. Fails to state a price and indicates that price shall be “price in effect at time delivery”.
3. States a price but qualifies it as being subject to “price in effect at time of delivery”.
4. Takes exceptions to the IFB terms and conditions.
5. Inserts the Bidder’s terms and conditions.
6. Limits the rights of the City under any Contract/Invitation for Bid clause.

E. Any Bid in which the price is considered to be unreasonable or is over budget.

F. Any Bid if the prices are determined to be unbalanced.

G. Bids received from any person or contractor that is suspended, debarred, proposed for debarment, or under investigation for fraud, including failure to pay federal, state, local or city taxes.

H. When a bid guarantee is required and the bidder fails to furnish the guarantee in accordance with the requirements of the IFB.

I. Low Bids received from bidders who are determined to be non-responsible in accordance with the City’s Procurement Rules and Regulations.

J. Any Bid that was prepared and submitted by a vendor who has been determined by the Procurement Services Manager to have an unfair advantage over other Bidders. Examples of an unfair advantage include, but are not limited to, the following:

1. A previous or prior employee who in the last six (6) months was directly involved in the design or specification preparation of the competed procurement.
2. A vendor who was directly involved in design or specification preparation of the competed project either for pay or voluntarily.

1.10 ESTIMATED QUANTITIES

If the Bid Form (Schedule A) herein contains estimated quantities, this provision is applicable. The quantities listed for each of the items in the Bid Form are only estimated quantities. Contractors are required to bid a firm unit price for each item specified. The actual quantities ordered may fluctuate up or down. The unit prices proposed by each Bidder will remain firm and will not be re-negotiated if the estimated quantities are not met or are exceeded. This clause will take precedence over any/all other estimated quantity clauses that conflict with this clause.

For bidding purposes, if there is a conflict between the extended total of an item and the unit price, the unit price shall prevail and be considered as the amount of the Bid. All unit prices shall include all necessary overhead and profit. Items not listed in the Bid Form such as overhead, profit, mobilization, de-mobilization, bonding, etc. shall be distributed throughout the Bidder's Unit Prices for the items listed on the Bid Form.

1.11 NUMBER OF COPIES

Bidders shall submit one electronic copy of each required document on the BidNet Direct Procurement Platform (www.bidnetdirect.com. Upon submission, all Bid documents shall become and remain the property of the City.

1.12 IDENTIFICATION OF BID

Bids must be submitted to the BidNet Direct Procurement Platform (www.bidnetdirect.com). The solicitation number and Offeror name must be clearly marked within the Bid.

Bid No.: B24-057CA
Due Date and Time: Thursday, May 16, 2024 by 3:00PM MST.

1.13 SALES TAX

The successful Offeror, if awarded a contract, shall apply to the Colorado Department of Revenue for a tax-exempt certificate for this project. The certificate does not apply to City of Colorado Springs Sales and Use Tax which shall be applicable and should be included in all bids and proposals. The tax exempt project number and the exemption certificate only apply to County, PPRTA (Pikes Peak Rural Transportation Authority), and State taxes when purchasing construction and building materials **to be incorporated into this project**.

Furthermore, the exemption **does not** include or apply to the purchase or rental of equipment, supplies or materials that **do not become a part of the completed project or structure**. In these instances, the purchase or rental is subject to full taxation at the current taxation rate.

The Offeror and all subcontractors shall include in their Offer City of Colorado Springs Sales and Use Tax on the work covered by the offer, and all other applicable taxes. Any increase in applicable sales or use tax occurring after the contract has been let shall be borne by the contractor and not passed through to the City.

Forms and instructions can be downloaded at the City of Colorado Springs Website:https://coloradosprings.gov/sales-tax/page/additional-sales-tax-forms?mlid=30771.
Questions can be directed to the City Sales Tax Division at (719) 385-5903 or Construction_SalesTax@ColoradoSprings.gov.

Our Registration Numbers are as follows:
City of Colorado Springs
Federal I.D.: 84-6000573
Federal Excise: A-138557
State Sales Tax: 98-03479

1.14 PREPARATION OF BID OFFER

A. Bidders are expected to examine the drawings, specifications, bid documents, proposed contract forms, terms and conditions, and all other instructions and solicitation documents. Bidders are expected to visit the job-site to determine all requirements and conditions that will affect the work. Failure to do so will not relieve a Bidder from their responsibility to know what is contained in this Invitation for Bid, or site conditions affecting the work.

B. The Bidder certifies that it has checked all of its figures and understands that the City will not be responsible for any errors or omissions on the part of the Bidders in preparing its Bid.

C. All items, (unless the invitation specifically states otherwise) including any additive or deductive alternates on the Bid Form, must be completely filled out or the Bid will be determined non-responsive and ineligible for consideration for award.

D. The Bidder declares that the person or persons signing this Bid is/are authorized to sign on behalf of the firm listed and to fully bind the Bidder to all the requirements of the IFB.

E. The Bidder certifies that no person or firm other than the Bidder or as otherwise indicated has any interest whatsoever in the Bid or the contract that may be entered into as a result of the Bid and that in all respects the Bid is legal and firm, submitted in good faith without collusion or fraud.

F. By submitting a Bid the Bidder certifies that it has complied and will comply with all requirements of local, state, and federal laws, and that no legal requirements have been or will be violated in making or accepting this Bid. Bidders are expected to review the City's Procurement Rules and Regulations, which will be used when determining whether a Bidder is responsive and responsible and awarding contracts in the best interest of the City.

G. If there is a discrepancy between the unit price and the total price, the unit price shall be used to determine the applicable total price. Bidders are responsible for including profit and overhead associated with the project when determining their unit prices.

1.15 BASIS OF AWARD

A. The City of Colorado Springs intends to award a contract to the lowest responsive and responsible Bidder whose Bid meets the requirements and the criteria set forth in the Invitation for Bids and is determined to be in the best interest of the City.

B. The City reserves the right to reject any or all Bids and to waive informalities and/or irregularities in a Bid. Whether or not a contract is awarded as a result of this Invitation for Bid, as stated above, Bid preparation costs are not reimbursable.

C. Total Bid will be evaluated and awarded as follows: It is the City's intent to award this bid based on the TOTAL BASE BID, not on a line item by line item basis.

1.16 PERIOD OF ACCEPTANCE

The Bidder agrees that its Bid shall remain open for acceptance by the City for a period of sixty (60) calendar days from the date specified in the IFB for receipt of Bids.

1.17 CONTRACT AWARD

The signature of the Bidder indicates that within ten (10) calendar days from acceptance of its Bid, it will execute a contract with the City and, if indicated in this IFB, furnish a project specific Certificate of Insurance naming the City as Additional Insured, furnish Performance, Labor and Materials, Payment and Maintenance Bonds and any other documents required by the Specifications or Contract Documents.

1.18 NOTICE TO PROCEED

Work may not start under any awarded contract until a written notice to proceed is issued by the City. The City may issue the Notice to Proceed any time after the contract is signed and, if required, insurance and bonds have been provided in accordance with 1.22 below.

1.19 AMENDMENTS TO THE SOLICITATION

Amendments are also referred to as addendum or addenda; and these terms shall be considered synonymous. It is the Bidder's responsibility to contact the Contracts Specialist listed in 1.21 below to confirm the number of Amendments which have been issued.

A. If this solicitation is amended, then all specifications, terms and conditions, which are not specifically amended, remain unchanged.

B. Bidders shall acknowledge receipt of any amendment to this solicitation by signing and returning the amendment and by identifying the amendment number and date in the space provided on the form for submitting a Bid.

C. Acknowledged amendments must be received prior to Bid opening. Bidders are encouraged to include signed addenda or initialed acknowledgment with returned Bids.

1.20 EXPLANATIONS TO PROSPECTIVE OFFERORS

Any prospective Bidder desiring an explanation or interpretation of the IFB documents, drawings, specifications, etc., must request it in writing within ten days of the Bid due date to allow enough time for a reply to reach all prospective offerors before the time for submission of offers. Oral explanations or instructions given before the opening of Bids will not be binding. Any information provided to a prospective Bidder during the Bid preparation stage will be promptly furnished to all other prospective Bidders as an amendment to the solicitation, if that information is necessary in submitting Bids or if the lack of it would be prejudicial to other prospective Bidders.

1.21 QUESTIONS AND OTHER REQUESTS FOR INFORMATION

All questions shall be submitted electronically via the BidNet Direct Procurement Platform (www.bidnetdirect.com). All questions must be received no later than **3:00PM MST Tuesday, April 30, 2024.**

Requests for information or support shall be directed to :

Crystal Abeyta
crystal.abeyta@coloradosprings.gov

DO NOT CONTACT ANY OTHER INDIVIDUAL AT THE CITY OF COLORADO SPRINGS REGARDING THIS SOLICITATION.

1.22 SECURITY REQUIREMENTS

A. Bid Security

1. If the total amount of the accumulative Bid is more than $50,000, or a bond is required elsewhere in this IFB, the Bidder is required to furnish with their Bid a bid security in the form of a bank certified check, bank cashier's check or a one-time bid bond underwritten by a company licensed to issue bonds in the State of Colorado and acceptable to the City in an amount equal to at least 5% of the total amount of the Bid payable without condition to the City.
2. The Bid security shall guarantee that the Bid will not be withdrawn or modified for a period of sixty (60) calendar days after the time set for the receipt of Bids, and, if the Bid is accepted within those sixty (60) calendar days, that the person, firm or corporation submitting same shall within ten (10) calendar days after being notified of the acceptance of its Bid, enter into a Contract and furnish the required bonds and all insurance certificates called for under this Invitation for Bid.
3. The Bid bonds of unsuccessful Bidders will not be returned to the respective Bidders unless a self-addressed, stamped envelope is provided along with a written request for bid bond return. However, if a certified check or a cashier's check is submitted as Bid security, it will be returned as soon as possible after the lowest responsive and responsible Bidder is determined and a contract is executed.
4. In the event the Bidder whose Bid is accepted fails to enter into the contract and/or furnish the required contract bonds, its certified check, cashier's check or bid bond will be forfeited in full to the City.

B. Performance, Labor and Materials Payment, and Maintenance Bonds

1. For contracts in excess of $50,000, the Contractor shall furnish to the City each of the following: a Performance Bond, a Labor and Materials Payment Bond, and a Maintenance Bond. Each such bond shall be in the amount of one hundred percent (100%) of the contract price. Bonds shall be submitted within ten (10) calendar days after notification of award of a Contract. The cost of all bonds shall be included in Contractor's Bid.
2. Bonds shall:
   a. Be for the full amount of the Contract price.
   b. Guarantee the Contractor's faithful performance of the work under the Contract, and the prompt and full payment for all labor and materials involved therein.
   c. Guarantee protection to the City against liens of any kind.
   d. Be from a surety company operating lawfully in the state of Colorado and accompanied by an acceptable "Power-of-Attorney" form attached to each bond copy.
   e. Be issued from a surety company that is acceptable to the City.
   f. Be submitted using the forms in the Exhibit section of this IFB or such forms as are approved by the City Attorney's Office.

1.23 SPECIFICATIONS AND DRAWINGS

No Fee solicitations: Specifications and Drawings are normally included in the IFB. If Specifications and Drawings are too large to be included in the IFB, all interested Bidders may obtain one copy of the Project Specifications and a set of the Project Drawings for use in preparing Bids from the City Procurement Services Division office. If the Bidder requires additional sets, it is the Bidder's responsibility to duplicate any additional copies, at its own expense.

1.24 TYPE OF CONTRACT

As a result of this Invitation for Bids, it is the City's intention to award a fixed unit price Contract based on the prices offered by the lowest responsive and responsible bidder. Contract prices shall remain firm and fixed throughout the Contract performance period.

1.25 F.O.B. DESTINATION

Unless otherwise specified in the Invitation for Bid, all goods, materials, supplies, equipment or services covered by this IFB shall be delivered F.O.B. Destination shall be the location indicated in the awarded Contract or Purchase Order.

1.26 BID RESULTS

The City does not mail Bid results or tabulations. However, Bid tabulations are posted and can be downloaded from BidNet. Bidders submitting Bids in response to this solicitation may also request the Bid tabulation for this solicitation via email to the Contracts Specialist indicated as the point of contact for this solicitation.

1.27 APPROPRIATION OF FUNDS

A. In the event funds are not appropriated in whole or in part sufficient for performance of the City's obligations under this IFB, or appropriated funds may not be expended due the City Charter spending limitations, then the City, without compensation to Bidders, may terminate or cancel this IFB or not award any contracts under this IFB.

B. In accordance with the Colorado Constitution and City Charter, performance of the City's obligations under any resultant Contract will be expressly subject to appropriations of funds by the City Council, and, in the event the budget or other means of appropriation for any year of the Contract fails to provide funds in sufficient amounts to discharge such obligations, such failure (i) shall act to terminate the Contract at such time as the then-existing and available appropriations are depleted, and (ii) neither such failure nor termination shall constitute a default or breach of the Contract, including any sub-agreement, attachment, schedule, or exhibit thereto, by the City.

1.28 PERIOD OF PERFORMANCE

The Contractor shall complete all work within **180 Calendar Days** after the Notice to Proceed. The Contractor shall start work promptly after receipt of the Notice to Proceed and Pre-Construction Meeting and continue to work diligently until all work is completed and accepted by the City.

1.29 BID DOCUMENTS

The following comprise this Invitation for Bid.

Schedule A – Bid Form
Schedule B – General Construction Terms and Conditions
Schedule C – Statement of Work
Schedule D – Project Specific Special Provisions
Schedule E – Technical Project Special Specifications

Schedule F – Construction Plans
Schedule G – Barnes Stormwater Management Plan
Schedule H – Barnes Drainage Report
Schedule I – Grading & Erosion Control
Schedule J – Stockpile Stormwater Management Plan
Schedule K – Stockpile Grading & Erosion Control
Schedule L – Variance Letter
Schedule M – Minimum Insurance Requirements
Schedule N – Exhibits

The following listed documents must be included with your Bid in order for your Bid submittal to be considered responsive.

Schedule A – Bid Form
Schedule M – Minimum Insurance Requirements Form
Exhibit 2 – Qualification Statement
Exhibit 3 – Bid Certification and Representations and Certifications
Exhibit 4 – Bid Bond if applicable (see 1.23)
Acknowledged Addenda, if issued

SECTION II – SCHEDULES

Schedule A – Bid Form
Schedule B – General Construction Terms and Conditions
Schedule C – Statement of Work
Schedule D – Project Specific Special Provisions
Schedule E – Technical Project Special Specifications
Schedule F – Construction Plans
Schedule G – Barnes Stormwater Management Plan
Schedule H – Barnes Drainage Report
Schedule I – Grading & Erosion Control
Schedule J – Stockpile Stormwater Management Plan
Schedule K – Stockpile Grading & Erosion Control
Schedule L – Variance Letter
Schedule M – Minimum Insurance Requirements
Schedule N – Exhibits

SCHEDULE A – BID FORM

Please Fill-in Excel Bid Form and submit directly in Bidnet (www.bidnetdirect.com)

SCHEDULE B – GENERAL CONSTRUCTION TERMS AND CONDITIONS

Schedule B -- General Construction Terms and Conditions, Version 100316 are hereby incorporated by reference, with the same force and effect as if they were given in full text. Upon request, the City will make their full text available. Also, the full text of a clause may be accessed electronically at this address:

https://www.coloradosprings.gov/finance/page/procurement-regulations-and-documents

The referenced General Construction Terms and Conditions will be incorporated in the resultant Contract.

SCHEDULE C – STATEMENT OF WORK

The project consists of construction of pond improvements including an impact basin, forebays, trickle channels, and an outlet structure, construction of a swale and storm sewer system, pipe outfall with headwall, wingwalls, and apron, emergency spillway with concrete wall, riprap, articulated concrete mat slope protection, Truegrid Paver and granite sand access roads, planting and/or seeding and restoration of areas disturbed during construction within approximately 6 acres adjacent to Sand Creek Detention Pond No. 2. The work is being completed to create a water quality pond within the project site.

A location approximately 0.6 miles from the project site has been designated for long-term stockpiling of excess cut material. This area is called “Sand Creek Stockpile area.” The stockpiled material will be used for future projects including Stand Creek Detention Pond No. 2 Restoration, Pond 2 to Barnes Road Sand Creek Restoration, and Coleman Park.

Construction is to begin as soon as possible and the Contractor will have 180 calendar days to complete all construction activities.

SCHEDULE D

PROJECT SPECIFIC SPECIAL PROVISIONS

The ***Project Specific Special Provisions*** amend or supplement the ***General Provisions*** of the Construction Contract and other provisions of the Contract Documents as indicated below. All Provisions, which are not so amended or supplemented, remain in full force and effect.

1.0 STANDARD SPECIFICATIONS

1.01 STANDARD SPECIFICATIONS

The ***Standard Specifications*** for this project shall be the *City of Colorado Springs City Engineering Division General Provisions and Standard Specifications*, (revised March 2005), except as modified hereinafter, which are incorporated in the contract documents by reference as though embodied herein in their entirety.

All contractors on this project are required to have on the job site and utilize the current updated copy of the *City of Colorado Springs City Engineering Division General Provisions and Standard Specifications*.

Copies are available online through the City of Colorado Springs internet site or for purchase at the cost of $20.00 from the City of Colorado Springs, Office Services Unit, 30 South Nevada Avenue, Suite L01, Colorado Springs, during regular business hours.

1.02 UTILITY SPECIFICATIONS

Listed below are utility department specifications that should be utilized (current issue or revision) in the construction and/or protection of the respective utility lines.

Hard copies of these specifications are available at Colorado Springs Utilities Development Services, 111 S. Cascade Avenue, Suite 105, Colorado Springs, Colorado 80903. The specifications can also be accessed online at www.csu.org/pages/standards-bulletins.aspx.

UTILITY SPECIFICATIONS

Colorado Springs Utilities
Wastewater Line Extension
And Service Standards

Colorado Springs Utilities
Water Line Extension
And Service Standards

Colorado Springs Utilities
Natural Gas Line Extension
And Service Standards

Colorado Springs Utilities
Electric Line Extension
And Service Standards

2.0 PROJECT SPECIFIC SPECIAL CONDITIONS

2.01 GENERAL

Work to be completed under this contract consists of furnishing all labor, materials, equipment, accessories, and performing all operations to complete the project work in accordance with the Drawings and Specifications.

All work shall be completed in accordance with the *City of Colorado Springs City Engineering Division General Provisions and Standard Specifications,* (revised March 2005,) referred to hereinafter as ***Standard Specifications***, except as modified in these ***Special Provisions*** and the ***Project Special Technical Specifications*** contained in Schedule F of this document.

The ***Contractor*** shall visit the jobsite to carefully examine the proposed work. The ***Contractor*** shall also thoroughly review the Drawings and Specifications. The ***Contractor*** shall satisfy himself as to the character, quality, and quantities of work to be performed, materials to be furnished, and as to the requirements of these Specifications.

2.02 PROJECT DESCRIPTION

General

The project consists of construction of pond improvements including an impact basin, forebays, trickle channels, and an outlet structure, construction of a swale and storm sewer system, pipe outfall with headwall, wingwalls, and apron, emergency spillway with concrete wall, riprap, articulated concrete mat slope protection, Truegrid Paver and granite sand access roads, planting and/or seeding and restoration of areas disturbed during construction within approximately 6 acres adjacent to Sand Creek Detention Pond No. 2. The work is being completed to create a water quality pond within the project site.

A location approximately 0.6 miles from the project site has been designated for long-term stockpiling of excess cut material. This area is called “Sand Creek Stockpile area.” The stockpiled material will be used for future projects including Stand Creek Detention Pond No. 2 Restoration, Pond 2 to Barnes Road Sand Creek Restoration, and Coleman Park.

2.03 CONTROL OF WORK

In case of any discrepancies in any of the Drawings, Standard Specifications, Special Provisions, and Technical Specifications, the order of precedence is as follows:

a) Project Specific Special Provisions
b) Project Special Technical Specifications
c) Drawings (***Plans***)
    i. General Drawings
    ii. Field Markings and Construction Oversight (Figure dimensions will govern over scaled dimensions on all ***Plans***)
d) General Provisions
e) City of Colorado Springs Engineering Division Standard Specifications
f) Colorado Springs Utilities Specifications
g) Digital drawing files if provided to the ***Contractor***.

2.04 OWNER

The City of Colorado Springs (hereinafter referred to as ***Owner***) shall administer this project including the finalization of any change orders, pay estimates and payments of such, acceptance of work, and other matters as stipulated in these Contract Documents.

2.05 ENGINEER

Engineer refers to the City Engineer of Colorado Springs or designated representative.

2.06 DRAWINGS

The drawings for this project are separate from the Contract Documents book and are entitled ***"Barnes Outfall Water Quality Pond"*** (hereinafter referred to as the ***Construction Plans*** or the ***Plans***).

In addition to the ***Construction Plans,*** this project has two sets of Grading and Erosion Control plans. One set, entitled ***"Barnes Outfall Water Quality Pond Stormwater Management Plan"***, is for the project site. The other set, entitled "***Sand Creek Stockpile Stormwater Management Plan"***, is for Sand Creek Stockpile area.

2.07 CONSTRUCTION LIMITS

The ***Contractor*** shall limit construction activities to the "Limits of Construction" or "Project Boundary" as shown in the ***Construction Plans*** and details and as described in these Special Provisions. Even within the designated limits of disturbance there are existing native trees, shrubs and grasses that are desirable to maintain. To the full extent practical, the ***Contractor*** shall perform the work in a manner that minimizes damage to the existing vegetation.

2.08 INSPECTION

At all times, representatives of the ***Owner or Owner's Representative*** and representatives of other agencies affected by the construction work, and the ***Owner or Owner's Representative*** shall have the right to enter and inspect any and all parts of the work for compliance with the ***Plans*** and Specifications.

The ***Owner or Owner's Representative*** shall decide any and all questions that may arise as to the quality and acceptability of the materials furnished, the work performed, the manner of performance, and the progress of the work. He shall decide all questions that may arise as to the acceptable fulfillment of the contract. The decision of the ***Owner or Owner's Representative*** shall be final.

The ***Contractor*** shall give inspection personnel a minimum of forty-eight (48) hours notice prior to needing inspection.

2.09 MATERIAL TESTING

The ***Contractor*** shall provide all materials testing for Quality Control for the project, which shall be considered incidental to the work. Testing shall be as specified in the City General Provisions Section 108.22 and the Project Special Technical Specifications. The City will provide Quality Assurance testing and reserves the right to reject any work completed by the ***Contractor*** based on failing tests from either the Quality Assurance or Quality Control provider. All materials test results shall be provided to the City on a weekly basis, with immediate notification of any failing tests. A final report documenting all tests completed, locations, and results shall be provided to the City upon project completion.

Testing shall be conducted at the following frequencies, which shall supersede any conflicts in the remainder of these specifications:

- Field Compaction Testing for "subgrade preparation, foundation subgrade, wingwall backfill, and cut-off wall backfill" zones-1 test per 500 cubic yards of material.
- Field Compaction Testing for remaining fill/subgrade prep-1 test per 1,000 cubic yards of material.
- Laboratory Moisture/Density Curve (Proctor): 1 per material type/change in material, and minimum 1 per 10,000 cubic yards of material.
- Material Classification Testing (gradation, Atterberg limits): 1 per material type/change in material, and minimum 1 per 10,000 cubic yards of material. Test

borrow/stockpiled material prior to placement. Minimum 1 test per 10,000 cu yds material and visual changes/variations in material type.

- Grout Testing: a minimum of 2 samples for strength testing shall be prepared per grouted boulder structure, or one per day per grouted boulder structure, whichever is greater. Strength, slump and air-content tests shall be as specified for concrete testing in Section 506 of the City General Specifications and Section 600 of the Special Technical Specifications. Requirements in the Special Technical Specifications shall supersede those in the City General Specifications.
- Concrete Testing: shall be as specified in Section 506 of the City General Specifications and Section 600 of the Special Technical Specifications. Requirements in the Special Technical Specifications shall supersede those in the City General Specifications.

2.10 EXISTING UTILITIES

No underground utility locating or utility potholing was performed in the design of this project. The ***Contractor*** shall field verify the existence and location of all existing utilities which might affect the work and shall notify the ***Owner or Owner's Representative*** of any utilities not shown on the ***Construction Plans***. The utilities shown on the ***Construction Plans*** are noted for informational purposes only and are believed to be correct. However, additional utilities may be present in the area. The ***Contractor*** must take sole responsibility for damage to any utility line encountered whether or not shown on the ***Plans*** and whether or not actually located in the field as shown on the ***Plans***. The ***Contractor*** shall notify the utility companies for field locations prior to the start of construction. This section is supplemental to the ***City General Provisions, Section 108.09.***

If the exact location and depth of existing outfalls or underground utilities are unknown, the ***Contractor*** shall perform all necessary exploratory excavation at his expense to locate these facilities which may affect the work prior to beginning construction. The ***Contractor*** shall notify the ***Engineer*** immediately of any utility discrepancies or conflicts.

The ***Contractor*** shall inform the ***Owner or Owner's Representative*** of existing utilities that may need to be relocated. The ***Contractor*** shall be responsible for contacting, coordinating, and requesting relocations from affected utility owners, and scheduling any relocation in his Work Sequence Plan to meet the Contract Time of Performance.

If the ***Contractor*** requests that utility companies relocate their utilities for his convenience in construction of any portion of the work, the cost of such shall be at the ***Contractor's*** expense.

Contract time will not be extended to account for repair of utilities that are damaged by the ***Contractor*** due to his negligence.

The ***Contractor*** will be required to contact all utility owners 72 hours prior to beginning excavation and/or grading.

Full compensation for compliance and cooperation, as required by this section, shall be considered to be included in the prices bid for items included on the contract bid schedule and no additional compensation will be provided.

2.11 FEES AND PERMITS

Except as noted below, the ***Contractor***, prior to commencing any work, shall secure at his own expense (including fees) all permits required for the performance of the work. Full compensation for compliance and cooperation, as required by this section for all permits except erosion and sediment control, shall be included in the prices bid for mobilization included on the contract bid schedule and no additional compensation will be provided. Erosion and sediment control

permitting shall be included in the price bid for Erosion and Sediment Control included on the contract bid schedule and no additional compensation will be provided.

The ***Owner*** will utilize a Regional General Permit for Permanent Extended Detention Basin (EDB) Maintenance Activities and a floodplain development permit for the project. The ***Contractor*** shall perform the work in conformance with the terms of these permits.

The ***Contractor*** shall obtain at a minimum a:

1. ***Traffic Control/Access Permit (City and CDOT),***
2. ***Air Quality Permit (El Paso County)***
3. ***A Grading and Erosion Control Permit (City),***
4. ***A Construction Stormwater Management Plan (City)***
5. ***An Excavation Permit (City),***
6. ***A Construction Dewatering Permit (Colorado Department of Public Health and Environment (CDPHE)), and***
7. ***A Construction Stormwater Discharge Permit (CDPHE)***.
8. ***Nesting Bird Survey Clearance, if needed***.

The ***Contractor*** shall comply with all requirements of the permits.

The ***Contractor*** shall submit required permits to the ***Owner*** for approval at or prior to the preconstruction meeting. The ***Contractor*** shall also submit a traffic control plan at the preconstruction meeting for approval by the ***Owner.*** The ***Contractor*** shall obtain any additional permits required for the construction of the project. The ***Contractor*** shall comply with all conditions of all the required permits.

2.12 WASTE MATERIALS

The ***Contractor*** shall clean up any debris created by his construction activities and shall dispose of the same in suitable trash containers on a daily basis. All debris shall be disposed of off-site at a disposal site approved by the ***Owner***. Should the ***Contractor*** fail to maintain the construction area in a suitable manner after receiving written notice from the ***City***, the ***Owner*** will have the right to contract with a third party and withhold any amounts incurred from the ***Contractor's*** payment.

2.13 OPERATIONS WITH OTHERS

The ***Owner*** reserves the right to have other work performed by other contractors and to permit the public utility companies and others to do work adjacent to or within the site. The ***Contractor*** shall conduct his operations and shall cooperate with the other parties to minimize interference with this other work.

2.14 CONSTRUCTION STAGING AND ACCESS

Staging areas shall be limited to those shown in the ***Plans***. The ***Contractor*** shall restore the staging areas as shown on the ***Plans*** for uplands areas at the completion of construction.

Access to the project areas shall be as shown in the ***Plans***. The ***Contractor*** shall be responsible for: establishing and maintaining the access routes during construction; limiting disturbances from vehicles and equipment to the width and length of the access route that is described in these Special Provisions and shown on the ***Plans***; and restoring the temporary access routes to match the pre-project condition at the completion of construction. The ***Contractor*** shall perform temporary removal and in-kind replacement of portions of fences as required. Some utility facilities are present within the construction access route. The ***Contractor*** shall take measures to protect all facilities in place in accordance with direction from the utility owner. Contractor shall coordinate with utility owner prior to mobilization to review the construction access route.

All areas affected by construction shall be cleaned and restored to existing site conditions or better at the completion of the project work. All work and costs associated with the use and restoration of staging and access areas shall be included in the bid price for Mobilization and no additional compensation will be provided.

2.15 SANITARY FACILITIES

The ***Contractor*** shall provide suitable temporary sanitary restroom facilities for use by the construction personnel. Wastes collected in the temporary facilities shall be removed and disposed of in a timely and satisfactory manner, as required to maintain the facilities in a sanitary usable condition. The ***Contractor*** shall maintain the facilities so that any offensive odor is controlled.

Full compensation for compliance and cooperation, as required by this section, shall be included in the prices bid for items included on the contract bid schedule and no additional compensation will be provided.

2.16 CONTRACTOR'S AND OWNER'S REPRESENTATIVES

The ***Contractor*** shall have on the job at all times as his agent, a competent superintendent capable of reading and thoroughly understanding the ***Plans*** and ***Specifications*** and being thoroughly experienced in the type of work being performed. The ***Owner*** will have a representative on the job site periodically to observe work for conformance with the ***Plans*** and ***Specifications*** and clarify questions the ***Contractor*** has relative to the job. The ***Contractor*** shall provide accurate records of any field changes made during construction.

2.17 DUST, EROSION, AND NOISE CONTROL

The ***Contractor*** shall be responsible to install sufficient temporary erosion control facilities to minimize erosion in areas impacted by access, staging, and construction activities. The ***Contractor*** shall repair, at no additional cost to the project, any erosion and washouts that may occur due to the lack of proper erosion control facilities.

The ***Contractor*** shall use measures to prevent and control dust and mud within the area affected by the project in accordance with applicable permits. No additional compensation will be paid to the ***Contractor*** for general dust control. ***Vehicle-tracking control mats will be required at the access points to the public and private paved roadways. Removal of vehicle-tracking mats will be accomplished prior to re-vegetation.***

The ***Contractor*** shall clean off any soil, dirt, and debris tracked onto any adjacent streets. When notified by the ***Owner*** that the adjacent streets require cleaning, the ***Contractor*** shall clean the streets within **2 hours** of such notification, or the ***Owner*** shall arrange to have the streets cleaned and shall deduct the cost of such cleaning from the ***Contractor's*** payments.

All work and materials associated with installation and maintenance of temporary erosion control facilities until permanent stabilization is achieved will be paid for in the lump sum price bid for temporary erosion and sediment control.

Construction noise shall be limited as required by the City Code and Charter, Chapter 9 – Public Offenses, Article 8.

2.18 TRAFFIC CONTROL AND PEDESTRIAN BARRICADES

The ***Contractor*** shall furnish all necessary flag persons; erect and maintain warning lights, advance warning signs, detour signs, barricades, temporary fence, and sufficient safeguards around all excavations, embankments, obstructions; and any other work for this project for the protection of all work being performed and for the safety of the public and pedestrian traffic, as well as bicycles and motor vehicles.

The ***Contractor*** shall provide adequate temporary construction fencing around active work zones and access routes when hazards to pedestrian traffic exist. The ***Contractor*** shall provide proper warning signs on existing trails, driveways, and roadways that cross or are a part of temporary access routes, staging areas or work zones.

All signs and barricades shall conform to the ***Manual of Uniform Traffic Control Devices*** and meet the requirements of ***General Provision 105.07 and Section 800 of the Standard Specifications.***

The ***Contractor*** shall submit three (3) copies of a ***Traffic Control Plan*** and accepted permit, acceptable to the ***Owner***, for review ***at or before the Preconstruction Conference***. This plan must provide traffic control at all access points, and when loading and unloading equipment and material in public street right-of -ways.

2.19 WATER CONTROL

Until the ***Owner*** issues final written acceptance of the project, the ***Contractor*** shall take every precaution against damage to any part of the project including the adjacent land, vegetation, utilities, paving and structures from any cause, including all surface and subsurface water, whether arising from the execution of work or any other cause. The ***Contractor*** shall rebuild, repair, restore, replant and make good all damages to any portion of the work due to causes beyond the control of and without the fault of negligence of the ***Contractor***, including but not restricted to high water, floods, or acts of God, of the public enemy, or of governmental authorities.

The ***Contractor*** shall be responsible for the project and shall take such precautions as may be necessary to construct the project in a dry condition and provide for drainage, dewatering, and control of all surface and subsurface water. The term water shall be interpreted as including water in all its forms including, but not limited to, liquid water, snow, and ice. The ***Contractor*** shall erect any necessary temporary structures or other facilities at his expense to control surface water and groundwater. ***The Contractor is advised that he is working in a major drainage course subject to continuous low flow and intermittent flow of significant magnitude. As such, proper management and control of water through the project area will be required to avoid localized flooding, damage to the work and adjacent facilities and properties and/or extensive soil erosion.*** *At or prior to the Preconstruction Conference* and prior to beginning any work, the ***Contractor*** shall submit three (3) copies of a plan for ***Water Control and Dewatering*** to the ***Owner*** for review***.*** The ***Owner***, at his option, may require the ***Contractor*** to update the **Water Control Plan** as conditions warrant. The ***Contractor*** shall acquire a ***Construction Dewatering Permit and Construction Stormwater Discharge Permit from the Colorado Department of Public Health and Environment***.

The ***Contractor*** shall carefully evaluate and plan the work and develop a water control plan that is compatible with the work plan and minimizes risks to adjacent properties, facilities and completed and in-progress work.

The ***Contractor***, at his expense, shall furnish all necessary equipment and materials required to control the surface and subsurface water in all the areas from start of work through the completion of the total project work. The ***Contractor*** shall perform all work associated with "Water Control and Dewatering" in accordance with the ***Section 920 "Water Control and Dewatering"*** included in the Project Special Technical Specifications.

2.20 PROGRESS

If the completion of any part of the work or the delivery of materials is behind the approved schedule, the ***Contractor*** must submit an updated schedule acceptable to the ***Owner*** for bringing the work up to meet the anticipated completion date. The ***Owner*** shall have the right to withhold progress payments for the work if the ***Contractor*** fails to update and submit the progress/manpower schedule and reports as specified.

2.21 PRE-CONSTRUCTION CONFERENCE RESPONSIBILITIES

The ***Contractor*** will attend a ***pre-construction meeting*** before beginning construction. The purpose of the meeting will be to discuss project issues, scheduling, phasing, environmental concerns, water control, private property issues, pedestrian issues, storm water clean water act, safety, etc., the ***Contractor's*** designated Superintendent or Supervisor assigned to the project shall attend this meeting. The ***Contractor*** *shall*, at a minimum, provide the following materials at or prior to the ***Pre-Construction Conference:***

1. Traffic Control and Pedestrian Safety Plan
2. Water Control and Dewatering Plan
3. Construction Dewatering Permit
4. Construction Stormwater Discharge Permit
5. Stormwater Management Plan (if revisions are requested from plan)
6. Construction Schedule and Manpower Report
7. Detailed Construction Method and Phasing Plan for Construction (Refer to 2.31)

The ***Plans*** are to be reviewed by the ***Owner*** prior to construction. All issues are to be resolved prior to beginning construction.

2.22 SHOP DRAWINGS

Contractor shall submit all required ***Shop Drawings and Product Submittals (digital in PDF format or 3 hard copies)*** to the ***Owner or Owner's Representative*** for review. These include, at a minimum, the following:

1. Test results for any imported riprap, aggregate bedding, grout, concrete, and boulders
2. Geotextiles
3. Seed (including origins), plantings, mulch, and erosion control blanket
4. Structural Concrete Mix Design including integral color
5. Structural Concrete Form Materials including formliner
6. Anti-Graffiti Coating manufacturer's data sheets
7. Structural Concrete Reinforcement Shop Drawings, Certificates, and Manufacturers Literature
8. Structural Steel shop drawings and manufacturer's data sheets including outlet structure grates, trash rack and orifice plate, and railing
9. Selective Site Demolition Methods and Operations
10. Manholes, inlets, and pipes
11. TrueGrid Pavers
12. Articulated Concrete Mat
13. Signs and posts

Owner shall respond to any **Shop Drawings** within 2 weeks of receipt.

2.23 COORDINATION WITH PRIVATE PROPERTY OWNERS

The ***Contractor*** is not to enter ***private property*** outside of the construction easements, as shown on the ***Plans,*** unless written access permission from the owner of the property is obtained by the ***Contractor*** and approved by the ***Owner***. All damages to private property shall be immediately repaired to as good or better conditions at no additional cost to the project. The ***Contractor*** will notify the ***Owner*** immediately if damages occur to private property.

2.24 MOBILIZATION

The Bid Schedule has an item for mobilization, which may include such items as administration, bonding, fees and permits, restoration of staging and access areas, and insurance. ***Mobilization shall be paid as shown in Section 627 of the Project Special Technical Specifications***.

2.25 DISPOSAL SITE

The ***Contractor*** is responsible for the removal of all debris, unsuitable material, asphalt, concrete, bushes, portions of trees not used in the work, stumps, remains from clearing and grubbing, and all other materials not used for the construction of the improvements. Disposal of these materials shall not be measured separately but included in the unit price bid for each applicable item on the bid schedule. The ***Contractor*** shall designate in writing a disposal site acceptable to the ***Owner***. Further, the ***Contractor*** shall consider the following for hauling suitable or disposing of unsuitable materials:

- Access to the project beyond the immediate confines of the work area shall be over suitable roadways without violation of any City, County, State, or Federal restrictions for vehicle and truck weights or any other limitation on movement of heavy equipment hauling materials to and from the site.
- ***Violation costs, including fines and repairs to either public or private roadways or appurtenance structures, above or below ground level, shall be at the Contractor's expense.***

Unless otherwise presented in the Bid Schedule, the ***Contractor's*** cost for loading, hauling, daily cleaning of streets and trails, the disposal of material that must be removed from the site, together with the construction, maintaining and altering of haul roads, dump fees and permits, shall not be paid for separately.

2.26 EXCAVATION AND REPLACEMENT OF UNSUITABLE MATERIAL

Excavation and Replacement of Unsuitable Material is defined in the Technical Specifications. The ***Contractor*** shall not complete any excavation and replacement of unsuitable material without prior written approval from the ***Owner***. Excavation and replacement of unsuitable material shall not be used in lieu of proper dewatering.

2.27 WORK HOURS

Normal work hours are 7:30 AM to 5:30 PM Monday through Friday. Work outside normal hours may be allowed but must be approved in advance in writing by the *Owner.*

2.28 ARCHAEOLOGICAL AND HISTORICAL DISCOVERIES

The ***Contractor*** is required to inform the ***Owner*** of any evidence which might suggest to a lay person that archaeological or historic materials may be present in the work area. Upon making such a discovery, the ***Contractor*** shall do whatever is necessary to avoid disturbing the work area. This could require that the ***Contractor's*** activities be redirected or stopped until the ***Owner*** or ***Engineer*** determines how to proceed.

2.29 CONSTRUCTION DOCUMENTATION

Photographs and Videos

1. Construction photographs will be required on the project illustrating pre-construction, construction, and post-construction conditions.
2. Photographs shall be 3" X 5" size or larger, matte finish, in color and mounted in 3-ring binders.
3. Each photograph shall be marked with date description and identification number.
4. Each photograph must indicate a station reference to work as shown on the ***Plans***.
5. The preconstruction photographs shall be delivered to and approved by the ***Owner*** or ***Owner's Representative***, prior to the beginning of construction.
6. Include progress photographs with each pay request. The photos will be a requirement for payment.
7. Digital pictures on a disk may be substituted for the above. However, the pictures must be named as described above.

8. ***Contractor*** shall procure and provide to the City an overhead drone video of before, during (on at least a monthly basis), and after site conditions along the entire project reach following the same flight path. Any cost associated with this item shall be considered incidental to Mobilization.

Red-line Drawings
The ***Contractor*** shall maintain a ***red-line set of drawings indicating field changes*** to the design, existing facilities not shown, pertinent construction data, etc. The ***Contractor*** shall submit a current set of red-line plans to the ***Owner*** with each pay estimate. The ***Contractor*** shall submit a complete set of red-line plans, including as-built survey to the ***Owner*** at the completion of the project. Red-line plans shall be completed and submitted in both CAD (in a version specified by the ***Owner***) and PDF.

Construction photographs and videos will not be paid for separately but will be considered incidental to the Bid Item for Mobilization. As-built survey and red-line drawings will be included in the Bid Item for Survey and Red-Line Drawings.

2.30 SPILL KIT

The ***Contractor*** shall supply and maintain a spill kit on-site. The spill kit shall contain any and all necessary devices to be used in the event of a spill on-site during construction activities. The *Contractor* shall coordinate with the ***Owner's*** stormwater inspector regarding the site-specific contents of the spill kit. The spill kit shall remain on-site and be available at all times for the *Contractor's* crew. A meeting shall be set up by the ***Contractor's*** Stormwater Supervisor prior to any construction activities to clarify the uses and implementation of the spill kit.

The spill kit will not be paid for separately but will be considered incidental to the Bid Item for Erosion and Sediment Control.

2.31 CONSTRUCTION METHOD AND PHASING PLAN

The Contractor shall submit a construction method and phasing plan detailing the methods and sequence to be utilized in construction of the proposed facilities. The plan is to include the following items:

1. Mobilization
2. Control and routing of base flows, flood flows, and groundwater;
3. Pedestrian, bicycle, and motorized vehicle Traffic Control as it relates to work phasing;
4. Establishment, maintenance, and restoration of access routes;
5. Pond construction;
6. Slope shaping, seeding, and planting;
7. Phasing.

The ***Owner*** is to review the construction method and phasing plan and have all questions and issues addressed before construction can proceed. All costs associated with preparation and potential revisions to the method and phasing plan will be considered incidental to the price bid for associated items and no separate payment will be provided.

2.32 REQUESTS FOR INFORMATION (RFI)

"Requests for Information" (RFI) sheets shall be completed by the ***Contractor*** if additional information of clarification is required. The **RFI** shall be submitted to the ***Owner*** for processing. ***Owner*** shall respond to any **RFIs** within 5 business days of receipt. Any changes to the ***Plans***, specifications, and construction requirements are to be made in writing. No changes will be permitted based on verbal agreements.

2.33 CONSTRUCTION COORDINATION MEETINGS

The ***Contractor will conduct weekly construction progress meetings*** with the attendance of all pertinent project related personnel. The ***Contractor*** shall coordinate with the ***Owner*** as to the location where the meetings are to be held. The ***Contractor*** shall create the meeting agenda and distribute meeting minutes within 24 hours of meetings.

2.34 CONSTRUCTION STAKING

The ***Contractor*** shall be responsible for providing grade and horizontal control for the project elements. At the ***Owner*** or ***Engineer's*** request, the ***Contractor*** shall survey grades and elevations to verify design during construction. The ***Contractor*** shall place stakes with flags at all property corners as specified on the ***Plans*** to delineate the work limits. The ***Contractor*** shall protect all existing control points, property corners and monuments. The ***Contractor*** shall be responsible for replacing any damaged or destroyed monument, property corner or control point. Any cost associated with providing surveying, grade control, or as built documentation is to be included in the Mobilization bid item.

2.35 CLEAN UP AND REMOVAL OF SEDIMENT DEPOSITS

The ***Contractor*** shall implement stabilization measures within the project area to control erosion to the extent practical. If sediment or other material from the site migrates downstream of the project area during construction, it shall be removed and disposed of by the ***Contractor*** without any additional compensation. The ***Contractor*** is advised to document the existing conditions in the channel and to provide a copy of the documentation to the ***Owner*** prior to beginning construction.

2.36 TOPSOIL AND SOIL PREPARATION

Contractor shall assume that the soil amendment for seeded areas shall be as specified in **Section 900.02.A** of the Project Special Technical Specifications. No topsoil is anticipated for this project. Anywhere topsoil is called out on plans, material shall be placed and then amended during soil preparation.

2.37 POND PERIMETER ACCESS ROAD

Granite sand aggregate shall be class 5 base course.

2.38 MEASUREMENT AND PAYMENT

The provisions for measurement and payment contained in this section replace and/or take precedence over the measurement and payment provisions contained in the ***Standard Specifications***.

Payment for work performed by the ***Contractor*** under these Contract Documents will be made at the approved unit price or lump sum price for each of the items as listed in the bid proposal and measured as hereinafter specified. Such payment shall compensate the ***Contractor*** for all costs in connection with furnishing all labor, equipment and material required and performing the operations necessary to complete the item in accordance with the contract documents. No partial payment shall be made for ordered, delivered, or stockpiled items.

Any items of work which are called out in the ***Plans*** and/or the specifications or are typical for the type of construction being accomplished and do not have a specific line item in the bid proposal but which are necessary to complete the work in accordance with the requirements of good and standard practice, such as sub-grade preparation and grading are to be considered as incidental to the construction of the project and the ***Contractor's*** cost for such work shall be included in the bid price for the related item of work.

The ***Contractor*** shall accomplish all incidental work essential to the completion of the project, including cleanup and disposal of waste or surplus material without additional cost to the ***Owner***. The cleanup and disposal of waste or surplus material shall be performed during construction or as soon after as is reasonably possible to better maintain the safety and aesthetics of the construction area.

The estimated quantities shown in the bid form are estimates only, being given only as the basis for tabulation and evaluation of the bid, and the City does not warrant, expressly or by implication, that the actual amount of work will correspond therewith. The right to increase or decrease the amount of any class or portion of the work or to make changes in the work required as may be deemed necessary is reserved by the City as provided elsewhere in these specifications. Unless otherwise noted in the following bid items descriptions, the basis of payment will be the plan/bid form quantity. The ***Contractor*** should perform an independent estimate of quantities and bring discrepancies in excess of 10% of the bid quantity to the attention of the ***Engineer*** before completion of their bid. It should be noted that certain bid items may be included in the Bid Form to establish a unit price should the use of those items become necessary during construction. Allowance will not be made for loss of anticipated profits of additional compensation should the use of these items be deemed unnecessary. Project survey of existing site conditions was completed in Fall 2021 and Summer 2022 by Merrick & Company with project control as stated on the ***Plans***. If the ***Contractor*** does not believe that the survey adequately represents the current site conditions, ***Contractor*** may at his expense and prior to submitting a Bid, procure an existing conditions survey to document any changed site conditions and necessary changes to earthwork or other quantities.

BID ITEMS DESCRIPTIONS:

Bid Item No. 1: Mobilization (LS)

a. Item Description

Mobilization shall consist of the preparatory work and operations in mobilizing for beginning work on the Project, obtain all required permits, construction staking, construction documentation photographs and videos, and restoring the site and demobilizing at the end of construction. This work shall include, but not be limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to the Project Site, and for the establishment of temporary offices, safety equipment and first aid supplies, sanitary and other facilities, as required by these Specifications, and State and local laws and regulations. The costs of bonds, plans, permits and any required insurance and other pre-construction expense necessary for the start of the work, excluding the cost of construction materials, shall also be included in this item.

b. Payment

Payment for the Bid Item shall include but is not limited to full compensation for all labor, equipment, tools, and materials necessary to mobilize and obtain permitting, and all other costs incurred or labor and operations which must be performed prior to beginning the other items under the contract, documentation during construction, site restoration, and demobilizing. Payment shall be made based on the applicable contract lump sum price for the Bid Item and shall include full compensation for all labor, equipment, tools, and materials necessary to complete the work.

Payment will be according to the following schedule:

1. When 5% of the original contract amount is earned, 50% of the amount bid for mobilization will be paid.
2. When 50% of the original contract amount is earned, the remaining 50% of the amount bid for mobilization will be paid.

Bid Item No. 2: Traffic Control (LS)

a. Item Description

This item includes all labor, materials, equipment, and tools required to meet the requirements of Section 800 of the ***Standard Specifications***.

b. Payment
Payment shall be made as a percentage of the Traffic Control Lump Sum amount equal to the percent-complete-to-date of the balance of the total contract amount less any previous payments for Traffic Control. In no case shall the total amount paid for Traffic Control exceed the Lump Sum shown in the bid schedule. Payments shall be considered full compensation for all labor, equipment, tools, and materials necessary to complete the work.

Bid Item No. 3: Water Control and Dewatering (LS)
a. Item Description
This work consists of all temporary measures needed to meet the requirements of Section 2.19 of these Special Provisions and Section 920 of the Project Special Technical Specifications during construction of the project. This bid item includes all the costs for labor, equipment, tools, and materials associated with the work.

b. Payment
The lump sum price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Preparing and submitting water control plan for review
2) Implementing measures to control surface water and groundwater
3) Providing temporary power and sound proofing, as required
4) Evaluating, designing, constructing, maintaining, replacing, and monitoring dewatering measures
5) Modifying the approved and implemented water control plan as necessary
6) Furnishing and installing all materials, sediment basins, diversion measures, slope drains, check dams, pumps, dewater bags, earth embankments, sheet pile, wells, stream crossings or any other material necessary for water control
7) Monitoring, sampling and analysis, and preparing water quality reports, if required
8) Protecting WORK from groundwater, base flows, and storm events
9) Providing all other related and necessary labor, equipment, and materials to complete the WORK.

Payment shall be made based on the applicable contract lump sum price for the Bid Item and shall include full compensation for all labor, equipment, tools, and materials necessary to complete the work.

1. When 25% of the original contract amount is earned, 34% of the amount bid for water control and dewatering will be paid.
2. When 50% of the original contract amount is earned, 33% of the amount bid for water control and dewatering will be paid.
3. When 100% of the original contract amount is earned, 33% of the amount bid for water control and dewatering will be paid.

Bid Item No. 4: Clearing and Grubbing (AC)
a. Item Description
Clearing and grubbing consists of clearing, grubbing, removing and disposing of all vegetation and trees 8” or smaller diameter, as needed to construct the proposed improvements as shown on the ***Plans*** and as required by the Work and not paid for by other bid items. Trees, vegetation, and objects designated to remain shall be preserved free from injury or defacement as part of this bid item.

b. Payment
Payment will be according to the total acreage cleared and grubbed. Payment for the Bid Item shall include but is not limited to full compensation for all labor, equipment, tools, and materials necessary to clear areas as required for site access, staging areas, and construction of the proposed improvements as indicated within the limits of disturbance. Payment shall not be made

for areas cleared unnecessarily, and such areas shall be restored at the ***Contractor's*** expense. Payment shall be made at the applicable contract unit price for the Bid Item and shall include full compensation for all labor, equipment, tools, and materials necessary to complete the work.

Bid Item No. 5: Erosion Control (LS)

a. Item Description

Erosion control shall be paid as a lump sum item, regardless of the facilities required to manage erosion in compliance with all permits and regulations.

b. Payment

Payment for this item shall include all earthwork, sediment control means and devices, pipes, temporary culverts, check dams, silt fencing, erosion control logs, vehicle tracking, construction access roads, and all other material, equipment, and operations necessary for erosion control measures. This bid item also includes removal of all erosion control measures when the project is complete. Payment shall be made based on the applicable contract lump sum price for the Bid Item and shall include full compensation for all labor, equipment, tools, and materials necessary to complete the work.

Payment will be according to the following schedule:

1. When 25% of the original contract amount is earned, 34% of the bid amount will be paid.
2. When 50% of the original contract amount is earned, 33% of the bid amount will be paid.
3. When 100% of the original contract amount is earned, 33% of the bid amount will be paid.

Bid Item No. 6: Remove Structures and Obstructions (LS)

a. Item Description

This item includes removing and properly disposing offsite concrete rubble, miscellaneous metals, handrailing, and other items as noted to be removed that are not covered by another pay item. This work also includes removal of any debris as necessary to complete the work. Items to be removed shall become the property of the ***Contractor***.

b. Payment

Payment shall be made on a percent complete basis as concrete or other debris is removed from the site and disposed of by the ***Contractor*** as approved by the ***Engineer***.

Bid Item No. 7: Soil Preparation (SF)

a. Item Description

This item includes preparing the seed bed and providing amendments to native soils per the requirements in Section 900 of the technical specifications. This bid item includes furnishing and installation of soil amendments including biotic soil amendments, soil stabilizers, and fertilizer, discing, raking, spreading, rolling, fine grading and any other work required to complete the work in accordance with the Drawings and Specifications. All disturbed areas will be prepared prior to installation of seed. The quantity of Soil Preparation to be paid for will be the measured surface area in square feet.

b. Payment

Payment shall be made at the applicable contract unit price for the Bid Item and shall be considered full compensation for all labor, equipment, tools, and materials necessary to complete the work. The work shall include furnishing and installing soil amendments and fertilizer, discing, raking, spreading, fine grading, and all other items of work involved preparing the soil for seeding.

Bid Item No. 8: Earthwork, Excavation (CY)

a. Item Description

The measurement for payment for this item will be the actual number of cubic yards of material excavated, computed by the average end area method or grid method (difference between

existing and finished grades) in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. No measurement of this item will be made unless changes to the CONTRACT DOCUMENTS are made, in which case the ENGINEER will perform measurement of the modified volume. The quantity is based on the neat lines shown on the DRAWINGS and does not account for shrinkage or swell, and does not include structural excavation or pre-excavation required to install other BID items. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Excavating, transporting, and stockpiling onsite with BMPs.
2) Cross hauling material
3) Removing, hauling, and disposing of deleterious materials
4) Providing all other related and necessary labor, equipment, and materials to complete the WORK.

b. Payment

Payment shall be based on units completed and accepted.

Bid Item No. 9: Earthwork, Fill with Onsite or Stockpiled Material (CY)

a. Item Description

The measurement for payment for this item will be the actual number of cubic yards of material used for fill, computed by the average end area method or grid method (difference between existing and finished grades) in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. No measurement of this item will be made unless changes to the CONTRACT DOCUMENTS are made, in which case the ENGINEER will perform measurement of the modified volume. The quantity is based on the neat lines shown on the DRAWINGS and does not account for shrinkage or swell, and does not include structural excavation or pre-excavation required to install other BID items. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Placing, reworking, and compacting fill material
2) Moistening, drying, and reconditioning material, as necessary, to meet moisture-density requirements
3) Surface roughening and terracing BMPs as shown on the DRAWINGS
4) Providing all other related and necessary labor, equipment, and materials to complete the WORK.

b. Payment

Payment shall be based on units completed and accepted.

Bid Item No. 10: Earthwork, Stockpile (CY)

a. Item Description

The measurement for payment for this item will be the actual number of cubic yards of material excavated and stockpiled, computed as the difference between Bid Item #8 and Bid Item #9. No measurement of this item will be made unless changes to the CONTRACT DOCUMENTS are made, in which case the ENGINEER will perform measurement of the modified volume. The quantity is based on the neat lines shown on the DRAWINGS and does not account for shrinkage or swell and does not include structural excavation or pre-excavation required to install other BID items. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Transporting and stockpiling with BMPs at the Sand Creek Stockpile area as designated by OWNER,
2) Removing, hauling, and disposing of deleterious materials
3) Providing all other related and necessary labor, equipment, and materials to complete the WORK.

b. Payment

Payment shall be based on units completed and accepted, with a cap of 80% of the bid quantity until 100% of Bid Items #8 and 9 have been completed and accepted.

Bid Item No. 11: Upland Seed and Mulch (SF)
Bid Item No. 12: Water Quality Seed and Mulch (SF)
Bid Item No. 13: Wetland/Riparian Seed and Mulch (SF)

a. Item Description

This item includes seeding and mulching as designated on the **Plans** and details. The quantity of seed and mulch to be paid for will be the measured surface area in square feet.

Materials shall be in accordance with the Standard Specifications as modified by the Special Technical Specifications.

b. Payment

Payment shall be made at the applicable contract unit price for the Bid Item and shall be considered full compensation for furnishing and installation of all materials; seeding, reseeding, weeding, and maintenance until final acceptance, and all other items necessary to develop a healthy stand of grass as shown on the drawings and in accordance with the specifications.

Bid Item No. 14: Deciduous Shrubs (#5 Container) (EA)

a. Item Description

The measurement for payment for this item will be per each shrub placed in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Providing, transporting, and installing plants
2) Excavating
3 Preparing soil and adding soil amendments
4) Mulching
5) Weeding
6) Watering during construction warranty period
7) Replacing dead or diseased plants during construction warranty period
8) Providing all other related and necessary labor, equipment, and materials to complete the WORK

b. Payment

Payment shall be made at the contract unit price on a per each basis for the accepted quantity of shrubs planted.

Bid Item No. 15: Deciduous Trees (2" Caliper) (EA)

a. Item Description

The measurement for payment for this item will be per each tree placed in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Furnishing, transporting, and installing all plants
2) Excavating
3) Preparing soil and adding soil amendments
4) Mulching
5) Stakes and guying wire
6) Weeding
7) Spraying for insect and disease control, as required
8) Maintaining trees
9) Watering during construction warranty period
10) Replacing dead or diseased plants during construction warranty period

11) Providing all other related and necessary labor, equipment, and materials to complete the WORK

b. Payment
Payment shall be made at the contract unit price per EA basis for the accepted quantity of trees planted.

Bid Item No. 16: Subsurface Soil Type L Riprap (CY)
Bid Item No. 17: Exposed Soil Type L Riprap with Geotextile (CY)

a. Item Description
This item includes the Soil Riprap of each type to be placed as indicated in the ***Plans*** and as directed by the ***Engineer***. The quantity of Soil Riprap to be paid for each type for will be measured in the field as the length multiplied by the average width of constructed riprap on the finished ground area of the riprap. The ground area will be multiplied by the specified depth of rock to determine the pay quantity in cubic yards. This work shall be performed in accordance with Section 624 of the ***Special Technical Specifications*** and with information in the ***Plans***.

b. Payment
Payment shall be made at the applicable contract unit price for the Bid Item multiplied by the field measured quantity and shall include full compensation for all labor, equipment, hauling, tools, and materials necessary to complete the work to place and install the Soil Riprap as shown in the contract documents including, but not limited to excavation, disposal of excess excavated soil, subgrade preparation, water control, rock materials, soil materials not paid for by another Bid Item, mixing, placement of mixed soil riprap, compaction, and bringing surrounding ground to finished grades.

Bid Item No. 18: Void-Permeated Type M Riprap with Geotextile (CY)

a. Item Description
This item includes the Void-Permeated Riprap of each type to be placed as indicated in the ***Plans*** and as directed by the ***Engineer***. The quantity of Void-Permeated Riprap to be paid for each type for will be measured in the field as the length multiplied by the average width of constructed riprap on the finished ground area of the riprap. The area will be multiplied by the specified depth of rock to determine the pay quantity in cubic yards. This work shall be performed in accordance with Section 624 of the ***Special Technical Specifications*** and with information in the ***Plans***.

b. Payment
Payment shall be made at the applicable contract unit price for the Bid Item multiplied by the field measured quantity and shall include full compensation for all labor, equipment, hauling, tools, and materials necessary to complete the work to place and install the Void-Permeated Riprap as shown in the contract documents including, but not limited to excavation, disposal of excess excavated soil, subgrade preparation, water control, rock materials, permeate materials, soil materials not paid for by another Bid Item, mixing, placement of mixed rock material, compaction, washing in of permeate material, and bringing surrounding ground to finished grades.

Bid Item No. 19: Articulated Concrete Mat (SF)

a. Item Description
This item includes the articulated concrete mat and required underlayment as shown in the plans. The quantity of Articulated Concrete Mat to be paid will be measured in the field as the length multiplied by the average width of constructed articulated concrete mat on the ground area. This work shall be performed in accordance with Section 626 of the ***Special Technical Specifications*** and with information in the ***Plans***.

b. Payment

Payment shall be made at the applicable contract unit price for the Bid Item multiplied by the field measured quantity and shall include full compensation for all labor, equipment, hauling, tools, and materials necessary to complete the work to provide, load, transport, and place the articulated concrete mat as shown in the contract documents including, but not limited to subgrade preparation, excavation, placement, anchoring, trenching, incidentals not paid for by another Bid Item, and bringing surrounding ground to finished grades.

Bid Item No. 20: Structural Concrete (CY)
Bid Item No. 21: Structural Concrete with Integral Color (CY)

a. Item Description

Structural Concrete will be measured by the cubic yard in accordance with the dimensions shown on the ***Plans***. Plan quantities reflect deductions for all voids designed into the structures. This work shall be performed in accordance with Section 600 of the Standard Specifications as modified by the Special Technical Specifications.

b. Payment

The accepted quantities will be paid for at the contract unit price per cubic yard of concrete placed. Payment shall include all materials, labor, and equipment required to place and install the reinforced concrete as shown in the contract documents including, but not limited to subgrade preparation, drainage holes and core, geotextile associated with drainage core, forming, rebar placement, form release, integral color, concrete, delivery, installation, curing, blanketing if required, testing, backfill, compaction and bringing surrounding ground to finished grades.

Bid Item No. 22: Concrete Flatwork (Trickle Channel and Sloped Paving) (LF)
Bid Item No. 23: Concrete Flatwork (Trickle Channel and Sloped Paving) with Integral Colored Concrete (LF)

a. Item Description

Concrete Flatwork will be measured by the lineal foot in accordance with the dimensions shown on the ***Plans***. Plan quantities reflect deductions for all voids designed into the structure. This work shall be performed in accordance with Section 600 of the Standard Specifications as modified by the Special Technical Specifications.

b. Payment

The accepted quantities will be paid for at the contract unit price per LF of concrete flatwork placed. Payment shall include all materials, labor, and equipment required to place and install the concrete as shown in the contract documents including, but not limited to subgrade preparation, bedding materials, forming, rebar placement, form release, saw cutting, expansion joints, control joints, integral color, concrete, concrete delivery, installation, curing, blanketing if required, testing, backfill, compaction and bringing surrounding ground to finished grades.

Bid Item No. 24: Remove 24" RCP (LF)
Bid Item No. 25: Remove 30" PVC (LF)
Bid Item No. 26: Remove 48" HDPE (LF)

a. Item Description

Measurement shall be from end to end of the portion of pipe removed. This item includes the removal and disposal of pipe at the locations as noted on the ***Plans***.

b. Payment

Payment shall be made at the applicable contract unit price for the Bid Item per lineal foot and shall be considered full compensation for all labor, equipment, tools, and materials necessary to remove, stockpile, load, transport, and dispose of the pipe.

Bid Item No. 27: RCP - 24" Diameter (LF)
Bid Item No. 28: RCP - 30" Diameter (LF)
Bid Item No. 29: RCP - 42" Diameter (LF)

Bid Item No. 30: RCP - 54" Diameter (LF)
Bid Item No. 31: RCP - 60" Diameter (LF)

a. Item Description
Measurement shall be from centerline of manholes to the end of the pipe, not including flared end sections. This item includes the trench excavation, subgrade preparation, pipe, installation of the pipe, fittings, as well as connecting to existing reinforced concrete pipe and all materials as required, including but not limited to gaskets, sealants, couplings, coatings and linings, bedding materials, trench backfill material, and backfilling to finished grade.

b. Payment
Payment shall be made at the applicable contract unit price for the Bid Item per lineal foot and shall be considered full compensation for all labor, equipment, tools, and materials necessary to prepare trench, subgrade, and bedding, load, transport, place, and backfill the pipe.

Bid Item No. 32: Drop Manhole (EA)
Bid Item No. 33: 4' Manhole, 5'-10' Rim to Sump Depth (EA)

a. Item Description
The measurement for payment for this item will be per each manhole placed in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Excavating, backfilling, and compacting, including imported backfill material if no suitable onsite material is available
2) Supporting trenches, shoring, or laying slopes back if shoring is not used
3) Furnishing, transporting, and installing all materials, including sheeting and/or bracing, bedding, concrete, reinforcing steel, precast bases, barrels, cones, and/or tops, grade rings, mortar, joint sealant, grout, manhole steps, ring and cover, and bolted lid.
4) Formwork and concrete testing, if CIP
5) Constructing and shaping the base invert, including all pipe incorporated within the manhole
6) Constructing required stub-outs and connections, including pipe and plugs
7) Removing and disposing debris, excess excavated materials, and damaged materials
8) Placing ramneck between barrel sections
9) Furnishing, transporting, and installing concrete collars, if required, including any required steel reinforcement
10) Furnishing, transporting, and placing flowfill material, if required
11) Interior and exterior water proofing, if required
12) Providing all other related work and necessary labor, equipment, and materials to complete the WORK.

b. Payment
Payment shall be made at the applicable contract unit price for the Bid Item based on units completed and accepted.

Bid Item No. 34: Type C Inlet, Close Mesh, Single Grate, >5' (EA)
Bid Item No. 35: Type C Inlet, Close Mesh, Double Grate, 10'-15' (EA)

a. Item Description
The measurement for payment for this item will be per each storm inlet placed in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Excavating, backfilling, and compacting; including imported backfill material if no suitable onsite material is available
2) Supporting trenches, shoring, or sloping trench walls back if shoring is not used
3) Protecting adjacent structures and property

4) Furnishing, transporting, and installing all materials, including precast structures, concrete, reinforcing steel, mortar and grout, grate, flowable fill, and any necessary connections
5) Formwork and concrete testing, if CIP
6) Constructing and shaping the base invert including finishing
7) Constructing required stub-outs and making connections including pipe and plugs
8) Removing and disposing debris, excess excavated materials, and damaged materials
9) Removing and replacing pavement, base course, subbase material, sod, and other surfacing material outside of the prescribed trench width that is not paid for under another BID ITEM
10) Providing all other related and necessary labor, equipment, and materials to complete the WORK.

b. Payment

Payment shall be made at the applicable contract unit price for the Bid Item based on units completed and accepted.

Bid Item No 36: Truegrid Pavers (SY)

a. Item Description

The measurement for payment for this item will be the actual number of square yards of Truegrid Pavers placed as part of the Truegrid Pavers Barnes Forebay Access Road and Truegrid Pavers Sky Sox Forebay Access Road in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. This BID item includes, but is not limited to, furnishing, transporting, and placing Truegrid Pavers and providing all related and necessary labor, equipment, subgrade preparation, and materials to complete the WORK.

b. Payment

The accepted quantities will be paid for at the contract unit price per square yard of Truegrid Pavers placed.

Bid Item No 37: Pond Perimeter Access Road (Granite Sand Aggregate) (LF)

a. Item Description

The measurement for payment for this item will be the actual number of lineal feet of Pond Perimeter Access Road placed in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Furnishing and transporting all granite sand material
2) Excavating, preparing subgrade, backfilling, placing and providing geotextile, placing granite sand, and compacting to the lines and grades shown on the DRAWINGS
3 Removing any debris, disposing unsuitable material, and transporting, stockpiling, and placing suitable excess material in fill areas within the PROJECT
4) Providing all other related and necessary labor, equipment, and materials to complete the WORK

b. Payment

The accepted quantities will be paid for at the contract unit price per lineal feet of Pond Perimeter Access Road placed.

Bid Item No 38: Additional Cost for Concrete Stain (Excluding Outlet Structure) (LS)

a. Item Description

This item will not be measured but will be paid on a lump sum basis for concrete stain placed on the structural concrete of structures, excluding the outlet structure, in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The lump sum price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Treating, patching, cleaning, and preparing concrete surfaces prior to treatment
2) Furnishing and applying the stain in locations as shown on DRAWINGS

3) Providing all other related and necessary labor, equipment, and materials to complete the WORK

b. Payment

Payment shall be made on a lump sum basis once all Concrete Stain has been applied.

Bid Item No 39: Concrete Formliner (Excluding Outlet Structure) (SFF)

a. Item Description

This item will be measured based upon the square feet facing of formliner placed on the Structural Concrete of structures in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Furnishing and applying the formliner and decorative joints
2) Providing all other related and necessary labor, equipment, and materials to complete the WORK
3) Providing touch-up work to fill holes, patching imperfections and tie holes

b. Payment

The accepted quantities will be paid for at the contract unit price per square feet facing of concrete formliner placed.

Bid Item No 40: Remove Tree (>8") (EA)

a. Item Description

The measurement for payment for this item will be the actual number of trees removed in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Removing, hauling, and disposing of Trees as shown on DRAWINGS
2) Backfilling and compacting after removal of Trees
3) Moisture conditioning of suitable backfill material
4) Providing all other related and necessary labor, equipment, and materials to complete the WORK

b. Payment

The accepted quantities will be paid for at the contract unit price per tree removed.

Bid Item No 41: Railing (LF)

a. Item Description

The measurement for payment for this item will be the actual number of linear feet of handrail placed in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Furnishing, measuring, fabricating, welding, blasting, priming, coating, painting, and installing handrail
2) Providing hardware necessary to anchor handrail
3) Providing all other related and necessary labor, equipment, and materials to complete the WORK

b. Payment

The accepted quantities will be paid for at the contract unit price per linear feet of railing placed.

Bid Item No. 42: Outlet Structure (Concrete, Orifice Plate, Close Mesh Grates, Trash Rack, Depth Gage) (EA)

Bid Item No. 43: Outlet Structure (with Integral Colored Concrete, Stain, Formliner, Orifice Plate, Close Mesh Grate, Trash Rack Depth Gage) (EA)

a. Item Description

The measurement for payment for this item will be made on a lump sum basis for Outlet Structure placed in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Excavating, backfilling, and compacting; including imported backfill material if no suitable onsite material is available
2) Supporting trenches, shoring, or sloping trench walls back if shoring is not used
3) Protecting adjacent structures and property
4) Furnishing, transporting, and installing all materials, including concrete, reinforcing steel, formwork, mortar and grout, orifice plate, close mesh grates, trash rack, neoprene gasket, steel channels, steel plate, access steps, flowable fill, depth gage, and any necessary connections
5) Constructing and shaping the base invert including finishing
6) Constructing required stub-outs and making connections including pipe and plugs
7) Disposing of material, excavating, backfilling, and compacting, including imported backfill material if no suitable onsite material is available
8) Removing and replacing pavement, base course, subbase material, sod, and other surfacing material outside of the prescribed trench width that is not paid for under another BID ITEM
9) Providing all other related and necessary labor, equipment, and materials to complete the WORK.

b. Payment

Payment will be made on made at the contract unit price based on units completed and accepted.

Bid Item No. 44: Flood Warning Sign (EA)

a. Item Description

The measurement for payment for this item will be per each Flood Warning Sign placed in accordance with the DRAWINGS and SPECIFICATIONS or as otherwise directed by the ENGINEER. The unit price will include all of the CONTRACTOR's costs. This BID item includes, but is not limited to:

1) Coordination with ENGINEER and OWNER regarding overall sign content, layout, and placement
2) Submitting layout for review and approval prior to sign production
3) Furnishing, transporting and installing all materials including sign supports, brackets, posts, bracing, concrete, and any necessary hardware
4) Excavation and compaction
5) Providing all other related and necessary labor, equipment, and materials to complete the WORK.

b. Payment

Payment will be made at the contract unit price based on units completed and accepted.

Bid Item No 45: Stockpile Maintenance (HR)

a. Item Description

The Sand Creek Stockpile area shall be maintained by the CONTRACTOR for a period of up to one year AFTER substantial completion of the PROJECT, at which point the Grading and Erosion Control permit for the Stockpile Site shall be transferred to another PERMITTEE. Payment will be made on a time and materials basis necessary to maintain the Sand Creek Stockpile area. Two hours per week shall be PRE-AUTHORIZED at the contract unit price for routine inspections and required documentation to the OWNER. Before any additional maintenance activities are authorized by the ENGINEER, the CONTRACTOR and OWNER shall agree in writing as to the additional cost for all employee wages, material, and equipment costs that may be necessary to complete the authorized maintenance work. The additional maintenance costs will be paid from

funds in the Force Account.

b. Measurement
The CONTRACTOR and the ENGINEER shall compare and agree upon the records of labor, equipment, and materials used for the stockpile maintenance in excess of the weekly inspections and documentation.

c. Payment
To receive payment, the CONTRACTOR shall provide itemized statements of all costs of such maintenance work detailed as follows:

- Name, classification, date, daily hours, total hours, wage rate, and extensions thereof for each worker and foreman;
- Quantities of materials, prices, and extensions thereof and transportation costs for materials. Attach invoices for all materials used or consumed. If the CONTRACTOR takes the materials from its own inventory, provide certification that:
    - The Material was taken from inventory;
    - The quantity claimed was actually used; and
    - The price and transportation costs claimed represent the Contractor's actual costs; and
- Designations, dates, daily hours, total hours, rental rates, and extensions thereof for each unit of equipment and transportation costs for equipment.

Bid Item No 46: Force Account (EA)
a. Item Description
If additional work arises that is necessary to accomplish the scope of work of the contract and is not identified elsewhere in the contract documents, the ENGINEER may authorize work under a force account basis. Payment will be made on a time and materials basis necessary to complete the authorized work. Before any work is authorized by the ENGINEER, the CONTRACTOR and ENGINEER shall agree in writing as to the rate for all employee wages, and material and equipment costs that may be necessary to complete the authorized work.

b. Measurement
Daily, the CONTRACTOR and the ENGINEER shall compare and agree upon the records of labor, equipment, and materials used for the force account work.

c. Payment
To receive payment, the CONTRACTOR shall provide itemized statements of all costs of such force account work detailed as follows:

- Name, classification, date, daily hours, total hours, wage rate, and extensions thereof for each worker and foreman;
- Quantities of materials, prices, and extensions thereof and transportation costs for materials. Attach invoices for all materials used or consumed. If the CONTRACTOR takes the materials from its own inventory, provide certification that:
    - The material was taken from inventory;
    - The quantity claimed was actually used; and
    - The price and transportation costs claimed represent the Contractor's actual costs; and
- Designations, dates, daily hours, total hours, rental rates, and extensions thereof for each unit of equipment and transportation costs for equipment.

SCHEDULE E

PROJECT SPECIAL TECHNICAL SPECIFICATIONS

The Technical Specifications for this project shall be the City of Colorado Springs; Engineering Division "Standard Specifications" (herein referenced as Standard Specifications) revised March 2005. The following Special Technical Specifications take precedence over, supplement, or modify the Standard Specifications.

INDEX OF REVISIONS AND ADDITIONS

SECTION REVISED OR ADDED

PROJECT SPECIAL TECHNICAL SPECIFICATIONS

REVISION OF SECTION 600 Structural Concrete

Replace Section 600 with the following:

PART 1 GENERAL

600.1.01 DESCRIPTION:

A. This section covers cast-in-place concrete, including furnishing materials, transporting, placing, finishing, curing and other appurtenant items of construction.

B. Inform Engineer at least 2 weeks in advance of time and places at which Contractor intends to place concrete. All preparation work for concrete placements shall be substantially completed at least 2 workdays prior to the scheduled start of concrete placement to allow for the Engineer's review and any necessary corrections.

600.1.02 QUALITY ASSURANCE:

A. Reference standards.

1. Except as noted or modified in this Section, all concrete materials, transporting, placing, finishing and curing shall conform to requirements of the latest and current versions of following standards:
   a. American Concrete Institute Standards (ACI)
      1) 117 Specification for Tolerances for Concrete Construction and Materials
      2) 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
      3) 301 Specifications for Concrete Construction .
      4) 304 Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.
      5) 304.2 Placing Concrete by Pumping Methods.
      6) 305 Recommended Practice for Hot Weather Concreting.
      7) 306 Recommended Practice for Cold Weather Concreting.
      8) 308 Standard Practice for Curing Concrete.
      9) 309 Recommended Practice for Consolidation of Concrete.
      10) 350 Code Requirements for Environmental Engineering Concrete Structures.
   b. American Society for Testing and Materials (ASTM).
      1) C94 Standard Specification for Ready Mixed Concrete

B. Contractor shall keep at least one copy of above listed ACI publications, latest edition, in project field office at all times.

C. Any material or operation specified by reference to the published specifications of a manufacturer shall be complied with unless directed otherwise by the Engineer.

D. In case of a conflict between the referenced specifications or standards and this Specification, the one having the more stringent requirements, as determined by the Engineer, shall govern.

E. Architectural Requirements

1. The Contractor shall submit details of the forming system to be used for the walls including details of formwork, form liner, form ties, thru bolts, rustications, finishing techniques and other items used in the construction of the wall. An elevation of the wall showing the layout of the formwork, form liner, form ties, chamfers, and other formwork details shall be submitted. An aesthetically pleasing layout and finished surface for the wall shall be provided.

2. Prior to construction the Contractor shall construct a sample panel of the proposed construction for the Engineer's approval. The panel shall be approximately 6 ft long by 4 ft high and of the same construction as the proposed wall. The sample panel shall show the workmanship, form liner, joints, form ties, color and texture to be used for the wall. The accepted panel shall form the standard for accepted finished work on the project.

600.1.03 SUBMITTALS: All submittals shall be made in accordance with Project Special Provisions Section 2.22. Mix designs, shop drawings and catalog information shall be submitted for related equipment and components, in order to show that concrete and items selected and to be installed by the Contractor generally conform to the Contract Documents. Submittal information includes, but is not necessarily limited to the following:

A. Miscellaneous product information.

1. Catalog information and shop drawings for: waterstops, admixtures, bonding agents, membrane curing compound, joint sealer, embedded items, non-shrink grout, wedge-type expansion anchors, and other concrete appurtenances.

B. Proposed concrete mix design. (Note: Contractor shall be responsible for fully informing the concrete supplier of all specification requirements regarding the concrete mix before the proposed mix design is submitted.)

1. The proportions of ingredients shall be selected to produce the proper workability (slump), durability (air content), strength, maximum water-cementitious materials ratio, time of set and other required properties of Sections 2.01 and 2.02.

   The proportion of ingredients shall be such as to produce a mixture with slump and durability that will work readily into the corners and angles of the forms and around reinforcement by the methods of placing and consolidation employed on the work. Do not permit the materials to segregate or excessive free water to collect on the surface.

   An independent testing laboratory acceptable to the Engineer shall perform concrete trial mixtures and testing. The costs of the mix designs and testing shall be borne by the Contractor.
   submitted concrete mixture will not receive final approval until a sample panel has been constructed and approved by the Engineer and Landscape Architect.

2. Prior to commencing concrete work, submit and obtain Engineer's review of certified test reports describing proposed concrete mix design, which shall be prepared in compliance with ACI Standard 301, with concrete proportions established on the basis of previous field experience or laboratory trial batches, except as modified herein. Test reports shall also include:
   a. Fine aggregates - Source, type, gradation, deleterious substances and bulk specific gravity on basis of weight of saturated surface-dry aggregate. ASTM C 128.
   b. Coarse aggregate - Source, type, gradation, deleterious substances and bulk specific gravity on basis of weight of saturated surface-dry aggregate. ASTM C 127.

c. Ratio of fine to total aggregates.
d. Weight (saturated surface-dry) of each aggregate per cubic yard.
e. Total water content in gallons per cubic yard.
f. Slump on which design is based.
g. Brand, type and quantity of cement.
h. Brand, type and quantity of admixtures.
i. Water-cementitious materials ratio (shall be not greater than specified in Part 2.02).
j. Air content (which shall be within the upper half of the allowable range).
k. For the laboratory trial batches method, the determination of the cementitious materials content necessary to attain the required strength and other properties, without exceeding the maximum water-cementitious materials ratio, shall be by preliminary tests in accordance with the following procedures:

Concrete trial mixtures having proportions and consistency suitable for the work shall be made using at least three different cementitious materials contents which will produce a range in strengths encompassing those required for the work.

Proportions of ingredients shall be determined and tests conducted in accordance with the basic relationships and procedures outlined in "Recommended Practice for Selecting Proportions for Normal and Heavy-Weight Concrete (Part I):" (ACI 211.1).

For each cementitious materials content, at least three specimens for each age to be tested shall be made and cured in accordance with "Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Laboratory" (ASTM C 192) and tested for strength at 1, 7, and 28 days. Tests shall be conducted in accordance with "Method of Test of Compressive Strength of Molded Concrete Cylinders" (ASTM C 39).

From the results of these tests, a curve shall be plotted showing the relationship between cementitious materials content and the average 28-day compressive strength. The minimum cementitious materials content to be used shall be that value shown by the curve to produce a strength of at least 1500 psi in 24 hours and at least 1200 psi greater than the 28-day strength specified. In any case, the minimum cementitious materials content shall not be less than that specified in Part 2.02.

If the previous field experience method is used in proportioning, the strengths shall be in compliance with ACI 301. In addition, the Contractor shall demonstrate the ability of the proposed mixture proportions to produce concrete meeting all the requirements of these Specifications. Field test records must be acceptable to the Engineer to use this method.

3. In addition to the test data described above, when it is expected that concrete will be placed under hot weather concrete conditions as defined in Section 600, Part 1.06.C, trial batches shall be tested at the maximum temperature that the concrete is expected to be placed. Alternatively, sufficient records may be submitted that show field concrete performance under these temperatures and which are acceptable to Engineer. For provisions for concrete placed under cold weather, see Part 1.05.B

C. Cylinder compression test reports.

1. Submit 2 copies of certified test reports to Engineer for 1.03.B.2.K.

D. Ready-mix delivery tickets.

1. Submit delivery tickets for each load at time of delivery indicating following:
   a. Quantity delivered with Mix Identification Number.
   b. Quantity of each material in batch.
   c. Outdoor temperature in shade.
   d. Time at which water was added.
   e. Elapsed time between when water was added and concrete load was in place.
   f. Amounts of initial and supplemental water added, including any corrections for water in aggregate. Note: Total water amount shall result in a water-cementitious materials ratio not greater than the maximum permissible.
   g. Name of individual authorizing supplemental water.
   h. Numerical sequence of delivery by indicating cumulative yardage delivered on each ticket.

600.1.04 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Cementitious materials.

1. Store in weather-tight enclosures and protect against dampness, contamination and warehouse set.

2. Do not use cementitious materials that have become caked or lumpy.

B. Aggregates.

1. Stockpile to prevent excessive segregation, or contamination with other materials or other sizes of aggregates.

2. Use only one supply source for each aggregate stockpile.

3. The bottom 6 in. of all aggregate piles in contact with ground shall not be used.

4. Frozen or partially frozen aggregates shall not be used.

C. Admixtures.

1. Store to prevent contamination, evaporation, or damage.

2. Protect liquid admixtures from freezing or harmful temperature ranges.

3. Agitate emulsions prior to use.

D. Rubber and plastic materials.

1. Store in cool place away from direct sunlight.

E. Mixing and transporting ready-mixed concrete.

1. Maximum elapsed time from time water is added to mix until concrete is in place shall not exceed 1-1/2 hours when concrete is transported in revolving drum truck bodies unless all other provisions of these specifications can be met, including maximum water-cementitious materials ratio, workability, strength and air content. Comply with ASTM C 94.

2. Do not use concrete transported without continuous agitation if the elapsed period between the time the concrete is mixed and the time it is placed is greater than 30 minutes. With the Engineer's approval, an approved retarding admixture may be used at the rate prescribed in Part 2.01.D.6. Also with the Engineer's approval, the mixed-to-placed time period may be extended an additional 30 minutes.
3. Do not use concrete transported with agitation when the time between start of mixing and placement is more than 90 minutes.
4. Deliver and handle concrete in a manner that will:
   a. Prevent objectionable segregation or damage to the concrete, and
   b. Facilitate placing with a minimum of handling.
5. Thoroughly clean and flush the compartment in which the concrete is transported to the work at intervals necessary to ensure hardened concrete will not accumulate in the compartment. Discharge flushing water from the compartment before it is charged with the next batch.
6. Obtain Engineer's approval for plant equipment, operation, and procedures.

600.1.05 JOB CONDITIONS:

A. Environmental requirements:

1. Do not place concrete during rain, sleet, or snow unless adequate protection is provided and Engineer's approval is obtained.

2. Do not allow rainwater to increase mixing water or damage surface finish.

3. For cold or hot weather concreting conditions, lab cured cylinder tests may not be an accurate indication of field achieved strengths. Under these weather conditions, the Engineer may require job cured cylinder breaks to determine field strength (cylinders to be job cured in same manner as the in-place concrete.) The Contractor shall pay for testing. Refer to Section 600, part 3.10 for related items to be furnished by Contractor. If cold or hot weather concreting practices specified in Sections 1.06.B and 1.06.C are not adhered to, the Engineer may require Contractor, at Contractor's expense, to provide additional pullout tests in accordance with ASTM C 900, job cured cylinder tests, or 2-inch diameter cored samples from areas in question to determine field strengths achieved.

4. Changes in temperature of the concrete shall be as uniform as possible and shall not exceed 10 Degrees F. in any 1-hour or 45 Degrees F. in any 24-hour period.

B. Cold Weather Concreting. Conform to ACI 306, "Cold Weather Concreting" in addition to this specification.

1. Temperature of concrete when placed shall not be less than following: Minimum Concrete Temp, Degrees F

Air Temp.	Sections with least dimension	
Degrees F	Under 12 in.	12 in. and Over
30 to 45	60	50
0 to 30	65	55
Below 0	70	60

If water or aggregate has been heated, the water and aggregate shall be combined in the mixer before cementitious materials are added. Cementitious materials shall not be added to mixture of water and aggregate when the temperature of the mixture is greater than 95ºF.

2. When placed, heated concrete shall not be warmer than 80ºF.

3. Prior to placing concrete, all ice, snow, surface and subsurface frost shall be removed, and temperature of surfaces to be in contact with new concrete, including subgrade materials and massive embedments such as rock, shall be raised to a minimum of 35ºF and a maximum of 60^0F. The entire mass of all massive embedments must be raised to this temperature range.

4. Protect concrete from freezing during specified curing period. See Part 3.09, Curing, for temperature to be maintained during initial curing period.

5. When the mean daily temperature of the atmosphere is less than 40ºF, forms shall be left in place a minimum of 5 days to aid in retaining heat.

6. Heated enclosures shall be strong and windproof to insure adequate protection of corners, edges and thin sections.

7. Do not permit heating units to locally heat or dry concrete.

8. Do not use combustion heaters during first 24 hours unless concrete is protected from exposure to exhaust gases, which contain carbon dioxide.

9. If air temperatures drop below 35ºF., the Contractor shall install a high-low temperature gauge into the most exposed portion of concrete during the curing protection period. The gauge shall be equipped to register the lowest overnight temperature. If the concrete temperature drops below the specified temperature, the curing period shall be extended until the degree-days (Part 3.09) are satisfied.

10. Refer to ACI 306 for further requirements.

C. Hot Weather Concreting: Conform to ACI 305, "Hot Weather Concreting" in addition to this specification.

1. Take precautions when ambient air temperature is 90ºF or above. These measures may include installation of windbreaks, shading, fog spraying, sprinkling, ponding, or wet covering of a light color. If daytime highs are expected to exceed 100ºF, floor and roof slab concrete shall be placed overnight, with placement commencing not prior to 3 hours before sunset.

2. Temperature of concrete when placed shall not exceed 85ºF.

3. Cool forms and reinforcing to a maximum of 90ºF by spraying with water prior to placing concrete.

4. Do not use cementitious materials that have reached a temperature of 105ºF or more at the time they enter the concrete mix.

5. Prevent plastic shrinkage cracking due to rapid evaporation of moisture.

6. Do not place concrete when evaporation rate (actual or anticipated) is 1.0 kg per square m per hour or above, as determined by Figure 2.1.5 of ACI 305.

7. Set-retarding and water-reducing admixtures may be used when the ambient air temperature is 90ºF or above to offset accelerating effects of high temperature.

8. Refer to ACI 305 for further requirements.

D. Protection from Mechanical Injury: During the curing period, the concrete shall be protected from damaging mechanical disturbances particularly load stresses, heavy shock and excessive vibration. All finished concrete surfaces shall be protected from damage caused by construction equipment, materials, or methods and by rain or running water. Self-supporting structures shall not be loaded in such a way as to over-stress the concrete.

PART 2 PRODUCTS

600.2.01 CONCRETE MATERIALS:

A. Cement shall conform to the "Standard Specification for Portland Cement," ASTM C 150, Type II low-alkali. Once cement type is chosen, the type and source shall remain the same throughout the project.

1. Fly ash shall be Class F (ASTM C 618).

B. Aggregates.

1. Fine aggregate - ASTM C 33.

2. Coarse aggregate - ASTM C 33 Size No. 57 or 67.

3. Once aggregates are chosen, the same source and type of aggregates shall be used throughout the project.

C. Water.

1. Shall be clean, fresh and free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to concrete or reinforcement.

D. Admixtures.

1. Use only as specified or reviewed and acceptable to Engineer.

2. Include any admixtures to be used in the proposed concrete mix designs. Use only admixtures which are compatible with each other and adjust required dosages accordingly.

3. Prohibited Admixtures: Calcium chloride, thiocyanates or admixtures containing more than 0.05% chloride ions are not permitted.

4. Air entraining Agent: ASTM C260. Use BASF (Master Builders) Micro- Air Air-entraining admixture or equal approved by the Engineer.

5. Water Reducing and Retarding Admixtures: ASTM C494. Contractor shall be responsible for its use and application of the proper dosage rate. It may also be necessary to adjust the quantity of air entraining agent. When fly ash is used in the concrete, the dosage rate shall be applied to both the cement and fly ash combined. Water reducing admixture shall be added at the plant and shall be Pozzolith 322N by BASF (Master Builders) or approved equal acceptable to the Engineer. Use retarders only as specified or with the Engineer's approval.

6. Mid-Range Water-Reducing Admixture: ASTM C494. Polyheed 1025 by BASF (Master Builders) or equal approved by the Engineer.

7. High Range Water-Reducing Admixture (Superplasticizer): “Eucon 37” by the Euclid Chemical Co., (HRWR) “Rheobuild 1000” by BASF (Master Builders) or “Sikament” by Sika Chemical Corp. The admixture shall conform to ASTM C494, Type F or G, and not contain more chloride ions than are present in municipal drinking water.

E. Tests for Chloride Ions.

1. For all concrete in which aluminum or galvanized metal is to be embedded, it shall be demonstrated by tests in accordance with AASHTO T-260 that the hardened concrete, including the aggregates, cementitious materials and any admixtures used, will not contain more than 0.06 percent water soluble chloride ions by weight of cement.

600.2.02 CONCRETE PRODUCTION:

A. Ready-mixed concrete.

1. Mixed and delivered, ASTM C 94.

2. Retempering. Indiscriminate addition of water to increase slump shall be prohibited.

Concrete shall be mixed only in quantities required for immediate use. Concrete that has partially set shall not be retempered but shall be discarded.

When concrete arrives at the project with slump below that suitable for placing, first the concrete shall be remixed for at least one minute at mixing speed. If the slump is still too low, water may be added only if the maximum permissible water-cementitious materials ratio is not exceeded, the maximum slump is not exceeded, and the temperature of the concrete is less than 90ºF. The water must be incorporated by additional mixing equal to at least half of the total mixing required. The Engineer must review such addition.

B. Batching and mixing equipment.

1. Conform to "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete," ACI 304.

C. Proportioning.

1. Proportion ingredients to produce a well-graded mix of high density and maximum workability consistent with the accepted mix design.

2. Entrained air, 6 ± 1½ percent for ASTM C 33 Size 67 or 57 coarse aggregate. Refer to ACI 301 for air entrainment required for other coarse aggregate sizes.

3. Refer to Part 1.04.E for mixing and transporting ready-mixed concrete requirements.

4. Strength and General Requirements.

Design and proportion concrete to meet the following minimum compressive strengths and other criteria:

Location	Design Strength 28-Day (psi)	ASTM C 33 Aggregate Size No.	Slump Inches ± 1.5 in.	Minimum Cement Content lb/yd3	Fly Ash Content lb/yd3	Maximum W-C Materials Ratio*
Structural Concrete	4500	57 or 67	3"min-5"max	tbd***	tbd***	0.42
Path Concrete**	4000	57 or 67	4	520	90	0.40
Concrete Fill Material	1500	57 or 67	2	tbd***	tbd***	0.33

*The maximum water-cementitious materials ratio by weight, which shall be based on all water in the mix, including correction for moisture in aggregates, and shall be based on the total cementitious materials including cement and fly ash, if any.

**Path concrete includes walks, trails, and all exterior associated concrete flatwork areas.

*** To be determined in mix design. The maximum percentage of flyash shall be 20%.

Admixtures Required Within this Specification (May be required in other Specifications, does not include admixtures related to mix design.)				
Type	Fibrous Concrete Reinforcement	Color Additive	Anti-Washout Admixture	Other
Structural	None	None	None	
Path	None	None	None	
Concrete Fill Material	None	None	None	
Grout – for Grouted Rock & Boulders	See Rock Specification	See Rock Specification	See Rock Specification	See Rock Specification

600.2.03 CONCRETE ACCESSORY MATERIALS:

A. Curing Materials.

1. Sheet material: ASTM C 171. Sheet material shall not be used on colored concrete.

2. Liquid membrane: membrane-curing compound shall be in accordance with ASTM C 309. Membrane curing compound shall be sprayable, 18% minimum solids content, MasterKure 123 or equivalent acceptable to the Engineer. The concrete will have a stain per the Landscape Architect. The curing compound shall be removed prior to application of the stain in a method approved by the Engineer and acceptable to the stain manufacturer.

B. Joint Sealers.

1. Joint Sealer: Joints indicated on Drawings, shall be sealed with a polyurethane joint sealer material of uniform, non-sag or self-leveling consistency as indicated. The sealant shall, when installed, tenaciously adhere to primed concrete surfaces and shall remain permanently elastomeric.

   The material shall be of a type that will, when properly installed, effectively and permanently seal joints subject to minor movements. Install with primer and cure in accordance with the manufacturer's instructions and recommendations.

Except as noted on the Drawings, joint sealer shall be Sikaflex 2C-NS or 2C-SL Elastic Sealant/Adhesive, as manufactured by Sika Chemical Corporation or other material acceptable to the Engineer. Add color as required to match adjacent surfaces where exposed to view.

C. Non-Shrink Grout: Non-shrink grout shall be "Masterflow 713" or equivalent acceptable to the Engineer. Grouts with iron filings are not acceptable. The grout shall be compatible with the surface to be bonded.

D. Epoxy Bonding Agent: Bonding agent shall be a two-component moisture insensitive epoxy adhesive, Sikadur 32, Hi-Mod or equivalent acceptable to the Engineer.

E. Expansion Joint Filler Material: Joint filler material shall be closed cell neoprene or rubber conforming to ASTM D 1056, Grade 2A3. Material shall be glued securely to concrete surfaces.

F. Sand-Cement Grout: Sand-cement grout, where specified, shall be a mixture of portland cement, sand and water with a maximum water-cement ratio of 0.38 by weight. The cement used shall be of the same type and source as used in the other concrete on this project. The grout shall have a consistency similar to thick paint.

G. Concrete Support Blocks: Concrete support blocks for the floor reinforcement and the support of the vertical reinforcement at the base of the wall shall be a mixture of portland cement, sand and water with a maximum water-cement ratio of 0.38 by weight. The cement used shall be of the same type and source as used in the other concrete on this project.

H. Waterstops – refer to Section 03-15-13 Waterstops for specification requirements.

I. Anti-Graffiti Coating: The coating shall be Chemprobe Series 626 Dur A Pell GS (Graffiti Shield) by Chemprobe Coating Systems, LP. Where the Anti-Graffiti Coating is to be used over stone veneers or Structural Concrete Coatings, verify compatibility of the materials prior to application. A material safety data sheet (MSDS) and a complete set of manufacturer's mixing and application instructions shall be submitted to the Engineer before the Contractor begins applying the coating.

PART 3 EXECUTION

600.3.01 INSPECTION:

A. General.

1. Assure that excavations and formwork are completed. Refer to Concrete Forming - Section 618 for formwork requirements.

2. Assure that dirt, mud, encrusted concrete, debris and excess water have been removed.

3. Check that reinforcement is properly positioned and secured in place. Refer to Reinforcement – Section 619 for steel reinforcement requirements.

4. Verify that expansion joint material, anchors, and other embedded items are secured in proper position.

600.3.02 PREPARATION:

A. General.

1. Remove any hardened concrete and foreign material from inner surface of conveying equipment.

2. Prepare slab subgrade in accordance with ACI 301.

3. Designate limits of each placement and obtain Engineer's review of entire installation prior to proceeding.

4. Subgrade for concrete flatwork (walks, trails, curb & gutter, etc.): Excavate to required depth, remove all soft, yielding material, replace with suitable on-site material. Place six-inch layer of approved free draining on-site material if determined to be necessary by the Engineer. Compact base to a firm, even surface. Compaction shall not be less than 95 percent dry density (ASTM D698).

B. Concrete placed against gravel or crushed stone.

1. Prevent loss of water from concrete with a minimum 2 in. layer of material having 25 percent fines passing a No. 4 sieve.

C. Concrete placed against rock.

1. Remove all loose pieces of rock.
2. Clean exposed rock surface in accordance with Soils Engineers recommendations.
3. Thoroughly wet hardened surface before placing fresh concrete.

D. Concrete placed against hardened or existing concrete.

1. Prior to placing fresh concrete against surface of hardened concrete, complete the following:
   a. Remove all laitance, foreign substances (including curing compound), wash with clean water, and thoroughly wet hardened surface before placing fresh concrete.
   b. Apply epoxy-bonding agent at blockouts, cutouts and in locations directed by Engineer.

600.3.03 PLACEMENT:

A. Conveying.

1. Convey concrete from mixer to final position as rapidly as practicable without segregation or loss of material.

2. Use only metal or metal-lined chutes with maximum length of 20 ft, having a maximum slope of 1 vertical to 2 horizontal, and a minimum slope of 1 vertical to 3 horizontal.

3. Provide a hopper at the end of long-belt conveyors and chutes not meeting the requirements in 2. above.

4. Conveying by pumping methods shall conform to ACI 304, Chapter 9.

B. Depositing in Walls.

1. Deposit concrete in a continuous operation until section is completed.

2. Concrete shall be deposited as nearly as practicable to its final position to avoid segregation due to rehandling or flowing.

3. Place concrete in approximately horizontal layers 2 ft maximum thickness.

4. Each layer of concrete shall be plastic when covered with following layer.

5. Rate of vertical rise not more than 2 ft per hour.

6. Provide placement capacity as necessary to comply with these requirements with construction and other joint locations shown on the Drawings.

7. Maximum height of concrete free fall, 4 ft.

8. Pump concrete or use a tremie having varying lengths for placing concrete in columns and walls to prevent free fall of more than 4 ft.

9. Concrete shall not be dropped through reinforcing steel nor subjected to any other procedure that will cause segregation.

10. Place and consolidate concrete in wall or column forms at least 24 hours prior to the time concrete or any reinforcing steel is placed in the system to be supported by such walls or columns except as noted below.

11. Do not exceed 6 ft of vertical height for any portion of a wall or column placed monolithically with floor or roof slab.

12. Allow concrete to thoroughly settle before top is finished. Remove all laitance, debris, and surplus water from surfaces at tops of forms by screeding, scraping, or other effective means.

13. Overfill forms wherever top of a wall will be exposed to weathering and after concrete has settled, screed off excess.

14. See Part 3.04 C. for preparation of construction joints prior to placing wall concrete.

C. Depositing in Floor and Roof Slabs.

1. Deposit concrete in a continuous operation until section is completed.

2. Concrete shall be deposited as nearly as practicable to its final position to avoid segregation due to rehandling or flowing.

3. Place concrete in strips approximately 10 ft wide approximately parallel to the wind direction at the time of placement. At least two placing crews shall be used, one working back and forth on each half of the slab, working the 10 ft wide strips continuously from one edge of the slab to the opposite edge.

4. Each strip of concrete shall be covered with 6 mil. thick plastic 12 ft. wide or Burlene, overlapped approximately 1.5 ft, prior to the development of plastic shrinkage cracks.

D. Depositing in Flatwork (Walks, Trails, Curb & Gutter, etc.).

1. Place concrete monolithically between expansion joints.

E. Consolidation.

1. During and immediately after placement, thoroughly compact and work around all reinforcements, embedments, and into corners of forms, eliminating all air or stone pockets that may cause honeycombing, pitting, or planes of weakness.

2. Use mechanical vibrators that will maintain at least 9,000 cycles per minute when immersed in concrete.

3. Minimum horsepower per vibrator shall be 1-1/2.

4. Number and type of vibrators shall be as acceptable to Engineer. A spare vibrator will be available at all times in case of mechanical problems.

5. Over-vibrating and the use of vibrators to transport concrete laterally in forms will not be allowed.

6. Vertically insert vibrators at points approximately 2 ft apart and to a depth to penetrate 6 in. into the preceding layer.

7. Vibrate each location for a length of time to obtain adequate consolidation (generally 5 to 15 seconds).

600.3.04 JOINTS:

A. Watertight joints (Waterstops).

1. Use at all locations where water is to be contained, groundwater is to be resisted and as shown on Drawings. Approved water stop is required at all such joints.

B. Expansion and contraction (control) joints.

1. At locations shown on Drawings.

2. Extend reinforcement continuously through joints, except "Expansion Joints," unless specifically shown on Drawings.

3. Form joint with felt, ASTM D 2475, where "bond breaker" is indicated.

4. Flexible joint filler material as indicated in Part 2.03, shall be used in Expansion Joints.

5. Expansion and contraction joints shall be caulked with a joint sealer as indicated in Part 2.03.

C. Construction joints.

1. Provide where shown on Drawings.

2. Obtain Engineer's approval for proposed locations of construction joints not shown on Drawings or for proposed elimination of construction joints shown on Drawings.

3. Locate joints to least impair the strength and serviceability of the structure, generally as follows:

a. Columns and walls.
   1) At underside of beams, girders, haunches, drop panels, slabs, and at floor levels.
   2) All haunches and drop panels shall be considered as parts of supported floor or roof and shall be placed monolithically therewith.
b. Suspended slabs.
   1) At or near mid-span in flat slab construction.
c. Construction joints in walls, beams, girders, and slabs shall be perpendicular to planes of their surfaces, with expansive rubber waterstops, and shall not be keyed except as shown on Drawings.
d. Maximum length of wall segments without construction joints shall be 500 ft or as shown on the Drawings.

4. The surfaces of concrete to be cast against shall be thoroughly cleaned and all laitance removed. Concrete shall be vibrated adequately to prevent honeycombing at the joint.

5. Construction joints shall require bond. After cleaning, before new concrete is placed, vertical joints shall be wetted unless otherwise detailed on Drawings or directed by Engineer. Prior to placement of concrete in walls, the bottom construction joint must be slushed with 2 to 3 in. of sand-cement grout. The sand-cement grout shall have a consistency similar to thick paint and shall be proportioned as specified in Part 2.03. The fresh concrete shall be placed before the grout has attained its initial set.

6. Joints where indicated on Drawings or where directed by the Engineer to receive an epoxy bonding agent shall have been prepared and the bonding agent applied in accordance with the manufacturer's recommendations prior to placing fresh concrete.

D. Joints for Concrete Flatwork (Walks, Trails, Curb and Gutter, etc.).

1. Construct all joints true to line with faces perpendicular to surface of the sidewalk, trail, etc. Maximum variance, ¼-inch from indicated position.

2. Expansion Joints: Place joints every 100 feet, or at cold joints, or where directed by the Engineer. Set joint material full depth of slab, ¼-inch below the surface. Anchor in place. Finish joints with a ¼-inch radius edger.

3. Control Joints: Place joints at the same interval as the width of the trail, but not more than 10 feet. Each joint will be struck perpendicular to the trail or where designated by the Engineer to a depth of ¼ of the thickness of the slab. Any joints not sufficiently deep will be saw cut to the required depth from the pavement surface. All joints shall be straight.

4. Where a scoring pattern is indicated, accomplish by cutting ¼ the depth of concrete with a trowel or by placing metal strips and removing and finishing with a ¼-inch radius edger. Sawed joints of ⅓-inch width will be acceptable.

5. Where existing or proposed structures, such as light standards, fire hydrants, and poles are within the limits of the sidewalk or flatwork area, score concrete in a block 8-inches wider than the maximum dimension of structure and place a ¼-inch premolded expansion joint around structure

600.3.05 FINISHING EXPOSED SURFACES:

A. Finishing unformed surfaces.

1. Slabs for aprons, slabs-on-grade, and tops of walls.

a. Provide surface conforming to proper elevation and contour. Except as noted otherwise on the Drawings, all walks and slabs shall slope 2 percent away from buildings. All other walks, exterior concrete steps, etc. shall be pitched to drain out with a slope of ¼ in. per ft. Tops of retaining walls shall be pitched back (into the backfill) 0.25 in. per ft unless designated otherwise by the Engineer. All aggregates shall be completely embedded in mortar by screeding.
   1) Screeded surfaces shall be free of surface irregularities.
   2) Maximum variation from a plane surface in any 10 ft section shall be ¼ in.

2. Coordination of Finishing and Placement.
   a. Mixing and placing shall be carefully coordinated with finishing. Concrete shall not be placed on the subgrade or forms more rapidly than it can be spread, straight edged, and bull floated. These operations must be performed before bleeding water has an opportunity to collect on the surface.
   b. To obtain good surfaces and avoid cold joints, the size of placing and finishing crews shall be planned with due regard for the effects of concrete temperature and atmospheric conditions on the rate of hardening of the concrete.
   c. All flatwork finishers on the project shall be ACI Certified flatwork finishers or equivalent acceptable to the Engineer.

3. Jointing and Edging.
   a. Joints in slabs shall be located and detailed as indicated on the Drawings and in the Specifications.
   b. Where saw-cut joints are required or permitted, cutting shall be timed properly with the set of the concrete. Cutting shall be started as soon as the concrete has hardened sufficiently to prevent aggregates from being dislodged by the saw. Cutting shall be completed before shrinkage stresses become sufficient to produce cracking. In all cases, the saw cutting shall be completed no later than within the first 12 hours after the slab finishing operations have been completed.
   c. Edge exposed edges of floated or troweled surfaces with a tool having a ¼ in. corner radius, unless these edges are specified to be beveled.

4. Consolidation.
   a. Concrete in slabs shall be thoroughly consolidated. Internal vibration shall be used in beams and girders of framed slabs and along the bulkheads of slabs on grade. Consolidation of slabs shall be obtained with vibrating screeds, roller pipe screeds, internal vibrators, or other acceptable means. The concrete surfaces shall not be manipulated prior to finishing operations.

5. Finishes.
   a. Unless selection of finishes is made in the Specifications or on the Drawings, the following finishes shall be used, as applicable.
      1) Floated Finish - Use for tops of walls, footings, pile caps, etc.
      2) Troweled Finish - Use for floors in finished areas and where called for on Drawings.
      3) Broom Finish - Use for floor slabs, concrete stairs, landings, sidewalks, concrete trails, curb and gutters.
      4) Raked Finish - Use for slabs to receive topping or secondary concrete
      5) Light Sandblast – As indicated on Drawings and Specifications
      6) Medium Sandblast – As indicated on Drawings and Specifications
   b. The following finishes shall be utilized on this project unless specified or detailed otherwise.
      1) Floated Finish.
         a) After the concrete has been placed, consolidated, struck-off, and leveled by bull floating, the concrete shall not be worked further until ready for floating. Floating shall begin when the water sheen

has disappeared and/or when the mix has stiffened sufficiently to permit the proper operation of a power-driven float. The surface shall then be consolidated with power-driven floats of the impact type, except in thin sections, such as pan slabs, which shall be floated by hand. Hand floating with wood or cork-faced floats shall be used in locations inaccessible to the power-driven machine. Trueness of surface shall be rechecked at this stage with a 10-foot straightedge applied at not less than two different angles. All high spots shall be cut down and all low spots filled during this procedure to produce planes checking true under the straightedge in any direction, with tolerances not exceeding ¼ in. in 10 ft. The slab shall then be refloated immediately to a uniform, smooth, granular texture.

2) Troweled Finish.
   a) Where a troweled finish is specified, the surface shall be finished first with impact power floats, as specified above where applicable, then with power trowels and finally with hand trowels. The first troweling after power floating shall be done by a power trowel and shall produce a smooth surface that is relatively free of defects, but which may still contain some trowel marks. Additional troweling shall be done by hand after the surface has hardened sufficiently. The final troweling shall be done when a ringing sound is produced as the trowel is moved over the surface. The surface shall be thoroughly consolidated by the hand troweling operations. The finished surface shall be free of any trowel marks and shall be uniform in texture and appearance, with tolerances not exceeding ¼ in. in 10 ft. On surfaces that support floor coverings, any defects of sufficient magnitude to show through the floor covering shall be removed by grinding.
3) Broom Finish.
   a) Slabs shall be given a coarse transverse-scored texture by drawing a broom across the surface. This operation shall follow immediately after bull floating operations and hand floating as required to close the surface. Provide a uniform abrasive texture of constant color. On paths, walks and trails, broom at right angles to normal traffic direction.
4) Rake Finish.
   a) Roughened concrete surface to a ½" minimum amplitude by raking.
5) Light Sandblast.
   a) Light sandblast is defined as that which leaves an even fine-grained surface in which the cement mortar has been removed to the extent of starting to expose the small aggregate. Complete operations for a smooth form finish. If necessary, use grout rubbed finish to repair surface areas. Add color to grout mix to match color of concrete where colored concrete is specified. Contractor shall prepare a 3-foot square sample panel, including color additive, for review by the Engineer.
6) Medium Sandblast.
   a) Medium sandblast is defined as that which leaves an even fine-grained surface in which cement mortar has been removed to the extent of exposing the small aggregate, and just starting to expose large aggregate. Complete operations for a smooth form finish. If necessary, use grout rubbed finish to repair surface areas. Add color to grout mix to match color of concrete where colored

concrete is specified. Contractor shall prepare a 3 foot square sample panel, including color additive, for review by the Engineer.

600.3.06 REPLACEMENT, REPAIRING AND PATCHING OF DEFECTIVE CONCRETE:

A. Removal and replacement of defective concrete:

1. After forms have been removed, any concrete that is not formed as shown on the Drawings, is out of alignment or level beyond the required tolerance, shows a defective surface that cannot be properly repaired or patched, or cannot be shown to prevent water migration through concrete surfaces or joints, shall be removed and replaced at the Contractor's expense.

2. Liquid retaining concrete walls, slabs, beams, etc., cannot have any honeycombing, cold joints, cracks greater than 0.004 in. wide, or leakage of water through the concrete thickness or joints. If in the opinion of the Engineer the honeycombing, cold joints, cracks or leakage are excessive, the Contractor shall be required to remove the complete concrete segment and replace it. Where minor honeycombing, cold joints, cracks or leakage occurs, it shall be repaired as indicated in Part 3.07.B and C below.

B. Repair of tie holes, blockouts, cutouts and defective concrete.

1. Immediately after form removal, repair, to the satisfaction of the Engineer, all repairable surface defects, including tie holes, in concrete surfaces. In all cases, repair work shall be completed within 24 hours of removal of the forms and prior to application of curing compound.

2. Replace, to satisfaction of Engineer, within 48 hours after adjacent forms have been removed, all other honeycombed and defective concrete areas that cannot be immediately repaired as noted in item 1 above.

3. Cut out and remove to sound concrete, with edges square-cut to avoid feathering, all honeycombed or otherwise defective concrete.

4. Repair work shall conform to ACI 301 and these specifications. At all blockouts, tie-holes and cutouts, after being thoroughly cleaned, apply an epoxy-bonding agent and fill with non-shrink grout, as specified in the materials section of this specification. Color shall be added to match surrounding concrete.

5. Perform in a manner that will not interfere with thorough curing of surrounding concrete.

6. Adequately cure all repair work.

C. Repair of cracks and minor honeycombed areas.

All cracks, minor honeycombed concrete or other areas of apparent leakage, including wet spots on walls, shall be sealed with Epoxy Sealant injection or other acceptable means so that the concrete is watertight.

600.3.07 FINISHING FORMED SURFACES:

A. Finishing.

1. Rough form finish - All surfaces not exposed to view such as surfaces in contact with earth.
   a. Chip off all fins and other surface projections greater than ¼ in. high.

b. Fill all tie holes and repair and patch all defects.

2. Smooth form finish - All exposed surfaces not generally exposed to view including interior surfaces of structures.
   a. Use form facing to produce a smooth, hard uniform surface.
   b. Keep number of seams to a minimum.
   c. Remove all fins and projections.
   d. Clean, coat, and fill all tie holes.
   e. Repair and patch all defects.

3. Grout-Rubbed Finish – Provide a grout-rubbed finish on all concrete surfaces exposed to view. Do not begin cleaning surface until all contiguous surfaces are completed and accessible and can be completed at the same time.
   a. Complete operation for smooth form finish (see above), then wet surface and apply grout mix of 1 part of Portland Cement and 1-1/2 parts of fine sand by volume with sufficient water to produce a grout having the consistency of thick paint. Substitute white Portland Cement for a part of the gray as required in order to produce a color matching the color of the surrounding concrete, as determined by a trial patch. Wet the surface of the concrete sufficiently to prevent absorption of water from the grout and apply the grout uniformly with brushes or a spray gun.
   b. Immediately after applying the grout, scrub the surface vigorously with a cork float or stone to coat the surface and fill all air bubbles and holes.
   c. While the grout is still plastic, remove all excess grout by working (rubbing) the surface with a rubber float, burlap, or other means.
   d. After the surface whitens from drying (about thirty minutes at normal temperatures), rub vigorously with clean burlap.
   e. The finish shall be kept damp for at least 36 hours after final rubbing.
   f. Proper curing temperatures need to be maintained just as with other concrete work.

4. Sandblast finish – Exposed surfaces exposed to view, where indicated on the Drawings to be sandblasted, shall include requirements of a smooth form finish followed by sandblasting to remove approximately 1/8-inch of surface concrete.
5. Anti-Graffiti Coating - All surfaces where noted on the Drawings, in the Specifications and/or in the Contract to receive an Anti-Graffiti Coating.
   a. Where an Anti-Graffiti Coating is called out on the Drawings, in the Specifications and/or in the Contract, the coating shall be applied to all exposed surfaces of the structure above the ground line, including all walls and headwalls, and shall also extend 6 inches below the finished ground line. This will require staged backfilling of the front face of the wall.
   b. Sidewalks, paths, concrete wall surfaces, wall caps, bridge bearing= devices, curb and barrier cover plates, steel fence, and steel rail shall be masked or otherwise protected to prevent Anti-Graffiti Coating from coming into contact with them.
   c. The final color of the Anti-Graffiti Coating shall be clear.
   d. The Anti-Graffiti Coating shall be applied in accordance with the manufacturer's instructions and recommendations.
   e. New mortar joints of any stonework shall be at least 28 days old, or as otherwise approved in writing by the Coating manufacturer, before the coating is applied.

600.3.08 CURING:

A. General.

1. Freshly deposited concrete shall be protected from premature drying and excessively hot or cold temperatures and shall be maintained without drying at a relatively constant temperature for the period of time necessary for the hydration of the cementitious materials

and proper hardening of the concrete. A list of all intended curing methods including a description of materials shall be submitted to the Engineer for review.

2. Initially, the concrete temperature shall be maintained at or above 70º F. for 3 days or at or above 50º F. for 5 days. Continue curing as required to achieve the specified 28-day strength. See Part 1.05 Job Conditions for additional information.

3. Keep concrete continuously moist for at least 7 days after placement by use of:
   a. Ponding or continuous sprinkling.
      1) Begin as quickly as possible after initial set.
      2) Provide complete coverage with minimum of runoff by regulating rate of water application.
      3) Interrupt application of water to walls for finishing or repair work only over areas being finished.
      4) Do not permit wall areas to become dry that are not being finished.
      5) Resume curing immediately after each day's finishing operations.
   b. Polyethylene film see Item C. below.
   c. Wet burlap, wet absorptive mats, or wet sand.
   d. Leave forms in place for concrete walls and keep wet.

4. Use membrane-curing compound as noted below.

B. Membrane curing compound (conforming to ASTM C 309).

1. Shall be used prior to placement of plastic sheeting on concrete floor and roof slabs, walls and other miscellaneous concrete areas where acceptable to Engineer.

2. Spray-apply in 2 coats perpendicular to each other at coverage recommended by manufacturer. Use clear membrane curing compound, not white, on flatwork (walks, trails, paths, etc.).

3. Cover unformed surfaces with curing compound within 30 minutes after final finishing.

4. Apply curing compound immediately to formed surfaces if forms are removed before end of specified curing period. Curing compound sprayed in tie holes is to be cleaned out before patching tie holes. Forms may be left in place for all or part of the curing period; wood forms shall be kept wet.

5. Protect compound against abrasion during curing period.

C. Film Curing (conforming to ASTM C 171).

1. Film curing shall not be used in lieu of water curing on tank floor and roof slabs. Use only where specifically reviewed and acceptable to Engineer.

2. Concrete placed early in the concrete placing operation shall not be allowed to dry out. Apply Membrane Curing Compound, or other material acceptable to the Engineer, as noted above prior to placing the polyethylene film or other coverings.

3. Begin as quickly as possible after initial set of concrete.

4. Cover surfaces completely with polyethylene sheeting.

5. Overlap edges for proper sealing and anchorage.

6. Cover joints between sheets with dunnage as required to prevent displacement due to wind or other factors.

7. Promptly repair all tears, holes, and other damage.

8. Anchor continuously all edges and anchor surface as necessary to prevent billowing.

600.3.09 QUALITY CONTROL:

A. Concrete tests.

1. Shall be paid for by the Contractor, except where noted otherwise in these specifications, and shall be in accordance with the requirements of ACI 301, except as noted or modified in this Section. Test specimens shall be taken by an ACI Certified Concrete Field-Testing Technician - Grade 1 in accordance with the "Standard Method of Making and Curing Concrete Test Specimens in the Field," ASTM C 31.
   a. Strength test.
      1) Mold and laboratory cure five cylinders from each sample.
      2) Test two cylinders at 14 days per ASTM C 39. Test two cylinders at 28 days for acceptance. Keep the remaining one as a spare to be tested as directed by Engineer.
      3) The spare cylinder for each sample may be eliminated after the first several concrete placements of each type of concrete if, in the opinion of the Engineer, test results are consistent and within specifications.
   b. Minimum samples.
      Collect the following minimum samples for each 28-day strength concrete used in the work for each day's placing:

Concrete Quantity	Number of Samples
50 yds3 or less	one
50 to 100 yds3	two
100 yds3 or more	two plus one sample for each additional 100 yds3

   c. Slump test.
      1) Conduct test for each strength test sample and whenever consistency of concrete appears to vary.
      2) Slump tests shall be made using "Method of Test for Slump of Portland Cement Concrete" (ASTM C 143).
   d. Air content.
      1) Conduct test from one of first three batches mixed each day and for each strength test sample.
      2) Samples indicating low air contents by the pressure method air content tests in accordance with ASTM C 231 shall be verified by the gravimetric method, ASTM C 138, and the volumetric method, ASTM C 173, before adding additional air entraining admixture in the field.

2. The Contractor shall provide the following to the Owner and the Testing Agency at no additional cost to the Owner:
   a. Incidental labor required to facilitate testing.
   b. Minimum one day's advance notice when concrete is to be placed.
   c. Storage facilities for concrete test cylinders; including, when necessary, a specially prepared box with high-low thermometer and thermostatically controlled heating devices in accordance with Section 9.2 of ASTM C 31 for storage of the cylinders for the first 24 hours after molding.
   d. Materials, samples, and access to materials as required for testing.

e. Reimbursement of costs for testing and inspection resulting as a consequence of the following:
   1) Work not in compliance with the Contract Documents.
   2) Testing requested by the Contractor or Subcontractor such as field-cured cylinder tests for stripping strengths, etc.
   3) Testing to verify the adequacy of work done, without prior notice, without proper supervision, or contrary to standard construction practice.

f. The use of testing services shall in no way relieve the Contractor of his responsibility to furnish materials and construction in full compliance with the Drawings and Specifications.

B. Acceptance of Concrete.

1. If the early strength tests fall below the early strengths deemed necessary to achieve the specified 28-day strength, the Engineer shall have the right to require conditions of temperature and moisture necessary to secure the required strength. The Engineer may also require pull out tests in accordance with ASTM C 900 or core tests in accordance with ASTM C 42.

2. Strength level of concrete will be considered satisfactory so long as average of all sets of two consecutive strength test results equals or exceeds specified 28-day strength and no individual strength test result falls below the specified strength by more than 500 psi.

C. Failure of Test Cylinder Results.

1. Upon failure of the 28-day test cylinder results, Engineer may require Contractor at his expense, to obtain and test at least three pullout tests or 2-in. diameter cored samples from area in question.

2. Concrete will be considered adequate if average of three pullout or core tests is at least 85 percent of, and if no single core is less than 75 percent of the specified 28-day strength.

3. Upon failure of the pullout or core test results, Engineer may require Contractor, at his expense, to perform load tests as specified in ACI 318, Chapter 20, or remove and replace as directed by the engineer.

4. In the event an area is found to be structurally unsound, the Engineer may order removal and replacement of concrete as required. The cost of the pullout or core tests, and the load test and the structural evaluation shall be borne by the Contractor.

5. Fill all pullout or core holes as specified for repairing defective concrete.

- END OF SECTION -

ADDITION OF SECTION 618 – CONCRETE FORMING

618.01 GENERAL

618.01.01 DESCRIPTION:

This section covers furnishing, erecting and removing forms for cast-in-place concrete.

618.01.02 QUALITY ASSURANCE:

A. Reference Standards:

1. American Concrete Institute Standards (ACI)
   a. 301 Specifications for Concrete Construction
   b. 347 Guide to Formwork
   c. As modified herein.

B. Design Criteria:

1. The Contractor shall design the formwork for the loads, lateral pressures and allowable stresses outlined in Chapter 1 of ACI 347.

C. Maximum Allowable Tolerances:

1. Variation from Plumb
   a. Lines and surfaces of columns, piers and walls
      1) In any 10 feet of length 1/4 inch
      2) Entire length 1 inch
   b. Control-joint grooves, and other conspicuous lines
      1) In any 20 feet of length 1/4 inch
      2) In 40 feet or more 3/4 inch

2. Variation from level or specified grade
   a. Slabs, beams and roof
      1) In any 10 feet of length 1/4 inch
      2) In any 20 feet of length 3/8 inch
      3) Entire length 3/4 inch

3. The maximum deflection of facing materials reflected in concrete surfaces exposed to view shall be 1/240 of the span between supporting members.

4. Refer to ACI 301 for additional requirements.

D. Architectural Requirements:

1. Submit details of the forming system to be used for the walls including details of formwork, form liner, form ties, thru bolts, rustications, finishing techniques and other items used in the construction of the wall. An elevation of the wall showing the layout of the formwork, form liner, form ties, chamfers, and other formwork details shall be submitted. An aesthetically pleasing layout and finished surface for the wall shall be provided.

2. Prior to construction the Contractor shall construct a sample panel of the proposed construction for the Engineer's approval. The panel shall be approximately 6 ft long by 4 ft high and of the same construction as the proposed wall. The sample panel shall show the workmanship, form liner, joints, form ties, color and texture to be used for the wall. The accepted panel shall form the standard for accepted finished work on the project.

618.01.03 SUBMITTALS: Submit certificate stating form materials to be used. All submittals shall be made in accordance with Project Special Provisions Section 2.22

618.02 PRODUCTS
618.02.01 FORM MATERIALS:

A. General: Where "Smooth Form Finish," or "Grout Cleaned Finish" is specified, use prefabricated plywood panel forms, job-built plywood forms, forms lined with plywood or fiberboard, or steel forms. Where "Rough Form Finish" is specified, unlined wooden forms may be used.

B. Form liner shall be as indicated on the Landscape Architect Drawings. Concrete placed in sections with a form liner shall be placed and consolidated as recommended by the form liner manufacturer and ACI Specifications. All formwork shall be approved by the Landscape Architect.

C. Steel Forms: Symons "Steel-Ply," Simplex "Industrial Steel FrameForms," Universal "Uniform" or equivalent.

D. Plywood Forms: Product Standard PS-1, - waterproof, resin-bonded exterior type Douglas fir.

E. Fiberboard Forms: Federal Spec LLL-B-810 - Type II tempered, waterproof, screenback, concrete form hardboard.

F. Lumber (Including Board and Batten Forms): Straight, uniform width and thickness, free from knots, offsets, holes, dents, and other surface defects. Lumber must be sufficiently sealed to prevent the absorption of water, form release agent, etc.

G. Chamfer strips: Clear white pine, surface against concrete planed.

H. Form ties:

1. Removable end, permanently embedded body type with waterstop.

2. Sufficient strength and rigidity to support and maintain the form in proper position and alignment without the use of auxiliary spreaders.

3. When cones are provided on the outer ends the permanently embedded portion shall be back a minimum of one inch from concrete surface.

4. Permanently embedded type without threaded ends shall be so constructed so that removable ends are readily broken off (one inch back from concrete surface) without damage to the concrete.

5. Form ties in exposed surfaces shall be uniformly spaced and aligned in horizontal and vertical rows. Form ties and their layout shall be approved by the Landscape Architect. Submit details of ties and proposed pattern for review.

I. Joints: Joints shall be flat, not keyed, with adhesive waterstops, unless otherwise shown on Drawings.

J. Polyethylene Film: Product Standard PS17; 6 mil.

K. Form Coating:

1. Non-staining chemical release agent that will not damage the concrete surfaces and appropriate for use in potable water structures.

2. For all exposed surfaces not in contact with earth backfill use Symons Corp. "Magic Kote", L & M "Debond" or equivalent.

3. The concrete will have a curing compound and stain finish applied to it. Form coating shall be compatible with these products or shall be removed in such manner that it doesn't effect the application of these products.

617.02 EXECUTION

617.02.01 ERECTION:

A. General:

1. Erect forms substantially and sufficiently tight to prevent leakage of mortar and braced or tied to maintain the desired position, shape and alignment before, during and after concrete placement. At vertical wall joints where forms overlay existing concrete, a mortar tight joint shall be required. Use a bead of silicone caulking or foam joint filler against concrete before placing form. Alternate methods shall be acceptable to the Engineer.

2. Use adequate walers, stiffeners and braces to ensure proper alignment and stability until the wall construction is completed.

3. Provide temporary openings at the bottom of column and wall forms and at other locations where necessary to facilitate cleaning and inspection.

4. Temporary openings in wall or column forms used to limit the free fall of concrete to a maximum of 4 feet shall be located to facilitate placing and consolidation of the concrete. Such openings in walls shall not exceed 8 feet laterally to avoid moving concrete laterally more than 4 feet.

5. If tremies of proper length are used for depositing concrete in walls or columns, temporary openings for concrete placement will not be required.

6. Whenever the top of a wall will be exposed to weathering, do not extend the forms on one side above the top of the wall; bring to true line and grade.

7. At other locations, bring forms to a true line and grade, or provide a wooden guide strip at the proper location on the forms so that the top surface can be finished with a screed or template for concrete which is to have a specified elevation, slope or contour.

8. At horizontal construction joints in walls, do not extend the forms on one side more than 2 feet above the joint. Horizontal construction joints shall not be used in walls of water retaining structures or exposed walls, unless reviewed and accepted by the Engineer.

9. Where concrete is placed against rock, remove all loose pieces of rock and clean the exposed surface with a high pressure hose.

B. Embedded Items:

1. Anchor bolts, castings, steel shapes, conduits, sleeves, waterstops, masonry anchorage and other materials that are to be embedded in the concrete shall be accurately positioned in the forms and securely anchored.

2. Install conduits in walls or slabs with reinforcement in both faces between the two faces of reinforcing steel.

3. In walls or slabs which have only a single mat of reinforcing steel, place conduits near the center of the wall or slab.

4. Unless installed in pipe sleeves, provide anchor bolts with sufficient threads to permit a nut to be installed on the concrete side of the form or template.

5. Install a second nut on the other side of the form or template and adjust the two nuts so the bolt will be held rigidly in proper position.

6. Assure embedments are clean when installed.

7. After concrete placement, clean surfaces not in contact with concrete of concrete mortar and other foreign substances.

C. Preparation of Form Surfaces:

1. Remove mortar, grout, and other foreign material from form surfaces.

2. Coat form surfaces with form coating material before either the reinforcing steel or concrete is placed. Ensure that dimension lumber board and batten forms are properly sealed so that they do not absorb form coating or water.

3. Do not allow form coating to:
   a. Stand in puddles in the forms.
   b. Come in contact with the reinforcing steel.
   c. Come in contact with adjacent hardened concrete against which fresh concrete is to be placed.

D. Edges and Corners:

1. Place chamfer strips in forms to bevel exposed edges and projecting corners. Tool the top edges of walls and slabs not indicated on the Drawings to be beveled.

2. Form beveled edges for all vertical and horizontal corners of equipment bases unless indicated otherwise on the Drawings.

3. Chamfer strip shall be 3/4 inch unless indicated otherwise on the Drawings.

E. Removal:

1. Do not remove or disturb forms until the concrete has attained sufficient strength to safely support all dead and live loads.

2. For beams, slabs and similar sections the shores and supports shall remain in place until the concrete has reached its specified 28-day strength, unless otherwise specified or permitted by the Engineer. Determine strength from pullout tests in accordance with ASTM C 900 or job cured cylinder breaks. Cylinders shall be job cured in same manner as the formed concrete.

3. Retain shoring in place and reinforce as necessary to carry out construction equipment, materials or other loads in excess of cured strength. Brace walls and columns after removal of forms to resist wind and construction loads.

4. Use care in form removal to avoid surface gouging, corner, or edge breakage, and other damage to the concrete.

5. Do not commence form removal for concrete not yet supporting loads, earlier than the following schedule, unless field cured cylinders and/or maturity meters indicate the concrete has reached 85 percent of the specified 28-day strength:

a.	Walls and columns	24 hours
b.	Vertical sides of beams and girders	24 hours
c.	Bottom forms and shoring for non-pre-stressed slabs, beams and girders under 10 feet clear span between permanent supports.	7 days
d.	Bottom forms and shoring for non-pre-stressed slabs, beams and girders between 10 and 20 feet clear span between permanent supports.	14 days
e.	Bottom forms and shoring for on prestressed slabs, beams and girders over 20 feet clear span between permanent supports.	21 days
f.	Refer to ACI 347, Chapter 2, for additional requirements.	

- END OF SECTION -

ADDITION OF SECTION 619 – REINFORCEMENT

619.01 GENERAL

619.01.01 **DESCRIPTION:** This section covers furnishing and installing steel bars and welded wire fabric for concrete reinforcement.

619.01.02 QUALITY ASSURANCE:

A. Reference Standards:

1. American Concrete Institute Standards (ACI)
   a. 301 Specifications for Concrete Construction.
   b. 315 Manual of Standard Practice for Detailing Reinforced Concrete Structures.
   c. 318 Code Requirements for Structural Concrete
   d. 350 Code Requirements for Environmental Engineering Concrete Structures.

2. As modified herein or on the Drawings.

B. Allowable Tolerances:

1. Fabrication Tolerances
   a. Sheared length: ± 1 inch
   b. Depth of truss: +0, -1/4 inch for concrete thickness 24 inches or less and +0, -1/2 inch for concrete thickness over 24 inches.
   c. Overall dimensions of stirrups, ties and spirals: +0, -1/4 inch for concrete thickness 24 inches or less and +0, -1/2 inch for concrete thickness over 24 inches.
   d. All other bends ± 1 inch.

2. Placement Tolerances

   See Section 619.03.02.C

619.01.03 SUBMITTALS: All submittals shall be made in accordance with Project Special Provisions Section 2.22.

A. Shop Drawings:

1. Before fabrication of reinforcing steel, the Contractor shall review and approve shop drawings, bar lists, fabrication and setting drawings and shall submit the same to Engineer for review.

2. Show sizes, quantity and dimensions for fabrication and placing of reinforcing bars and bar supports. Indicate bar schedules, stirrup spacing, and diagrams of bent bars.

B. Certificates: Mill test certificates identifying chemical and physical analysis of each load of reinforcing steel delivered.

C. Manufacturer's Literature: Manufacturer's specifications and installation instructions for splice devices when these devices are called for on the Drawings.

619.01.04 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Deliver to site in bundles marked with metal tags indicating bar size and length.

B. Carefully handle and store on supports that will keep the steel from coming in contact with the ground or standing water.

619.02 PRODUCTS

619.02.01 REINFORCEMENT BARS:

A. Bars: Steel reinforcement bars shall be new, deformed billet steel, meeting ASTM A 615; Grade 60. Weldable reinforcement bars shall conform to ASTM A 706, Grade 60.

B. Epoxy Coated Bars: Epoxy coated steel reinforcing bars shall be new, deformed billet steel, meeting ASTM A775/A775M; Grade 60. Coatings shall be applied in plants that are certified in accordance with Concrete Reinforcing Steel Institute (CRSI) Epoxy Coating Plant Certification Program or equivalent. Damage to coating due to shipment, storage and handling shall be repaired in accordance with manufacture's written recommendations.

C. Tie Wire: Annealed steel, Fed. Spec. QQ-W-461, 16 gauge minimum, epoxy coated.

D. Fabrication: In accordance with CRSI Manual of Standard Practice except for the allowable tolerances specified herein in 619.01.02B.

619.02.02 BAR SUPPORTS:

A. Conform to "Bar Support Specifications," CRSI Manual of Standard Practice.

B. The portions of the supports or accessories within ½ inch of the concrete surface shall be coated with plastic at least 3/32-inch thick at points of contact with the formwork. Other requirements shall be in accordance with Class 1, maximum protection, plastic protected bar supports, in Chapter 3 of the Manual of Standard Practice by CRSI.

619.02.03 **WELDED WIRE REINFORCEMENT:** Welded Wire Reinforcement shall be electrically welded wire fabric of cold-drawn wire (70,000 psi yield point) of gauge and mesh size shown on the drawings and shall conform to "Specification for Welded Steel Wire Reinforcement for Concrete Reinforcement" (ASTM A 1064).

619.02.04 **BAR COUPLERS:** Reinforcing steel bar splicing couplers shall be a mechanical type as manufactured by BarSplice Products Inc., or equal. Couplers shall develop 125% of the specified yield strength of the reinforcing bars. Make field demonstrations and sample splicing prior to splicing bars being included into the work.

619.03 EXECUTION

619.03.01 PREPARATION:

A. Remove all mud, oil, loose rust or mill scale or other foreign materials on reinforcing bars that may reduce bond prior to pouring concrete.

B. Rust or mill scale that is "tight" will be permissible without cleaning or brushing provided weights, dimensions, cross-sectional area, and tensile properties meet requirements of ASTM A 615.

619.03.02 INSTALLATION:

A. Bar Placement:

1. Conform to CRSI-WCRSI "Placing Reinforcing Steel."

2. Reinforcement shall be supported and wired together to prevent displacement by construction loads or the placing of concrete.

B. Bar Supports:

1. Provide at least the number of supports as required by ACI 315.

2. All reinforcement shall be tied to chairs to secure them from displacement during concrete placement. Reinforcement shall be secured at a maximum distance of four feet on center. All chairs shall be stapled to wooden soffits. Staples and tie wire only shall be used to secure chairs to forms, except as reviewed by the Engineer.

3. Do not use pebbles, pieces of broken stone, common or face brick, metal pipe or wood blocks to support reinforcement.

C. Placement Tolerances:

1. Clear distance to formed surface: See 619.03.02 D.1 and 619.03.02 D.2.

2. Minimum spacing between bars: -1/4 inch

3. Top bars in slabs and beams: See 619.03.02 D.1 and 619.03.02.D.2.

4. Spacing crosswise of members: Spaced evenly within 2 inches.

5. Lengthwise of members: $\pm$ 2 inches.

6. Maximum bar movement to avoid interference with other reinforcing steel, conduits or embedded items: one bar diameter. If bars are moved more than one bar diameter, or enough to exceed the above tolerances, the resulting arrangement of bars may be rejected by the Engineer.

D. Concrete Cover:

1. Except as otherwise indicated on the Drawings, provide the following minimum concrete cover for reinforcement.
   a. Unformed surfaces adjacent to excavation
      Non-prestressed Concrete 2 inches
   b. Formed or top surfaces exposed to weather or saturated air, submerged or in contact with earth.
      Non-prestressed Concrete 2 inches
   c. Other locations:
      Bars in beams or columns, including stirrups & ties: 2 inches
   d. Placed against earth 3 inches

2. Cover for reinforcing steel shall not be less than the minimum given above (no minus tolerance) and shall not exceed the minimum by more than 1/4 inch where concrete thickness is 24 inches or less, or more than ½ inch where the concrete thickness is more than 24 inches.

E. Reinforcement Adjustment:

1. Move reinforcing bars only as stated under 3-2 C 6.

2. Do not heat, bend or cut bars without Engineer's approval.

3. Grade 60 bars shall not be bent after being partially embedded in hardened concrete unless approved by engineer.

F. Splices:

1. Do not splice bars except at locations shown on the Drawings without the Engineer's approval.

2. Minimum lap distance shall be as shown on the Drawings. If not shown, splices shall be Class B tension lap splice as specified in ACI 318.

2. Tie splices securely to prevent displacement by construction loads or during placement of concrete.

3. Splices in wall reinforcement and slabs shall be staggered such that no more than one bar in two is spliced in any four-foot-wide vertical section.

4. Reinforcement shall be continuous around corners or corner bars provided.

G. Welded Wire Reinforcement:

1. Install in longest practicable length.

2. Lap adjoining pieces 2 meshes plus end extension of wires, but not less than 12 inches in structural slabs.

3. Do not locate laps midway between, or directly over, support members of continuous structures.

4. Offset laps in adjacent widths to prevent continuous laps.

5. Extend reinforcement through contraction joints and construction joints unless otherwise indicated on the Drawings.

- END OF SECTION -

REVISION OF SECTION 620 DRAINAGE CHANNELS

Section 620 of the Standard Specifications is hereby revised as follows:

Under Subsection 621.01, add the following:

CONTRACTOR to review and familiarize themselves with the project Geotechnical Evaluation Report prepared by Vivid Engineering Group, included with the bid package.

Revise Subsection 621.04 to delete the words “at no additional cost to the owner” and replace with “all of the costs for dewatering shall be included in the Lump Sum bid price for Water Control and Dewatering”.

Under Subsection 621.05 Modify the Following:

In Paragraph B modify the compaction standard for cohesionless soils to be 95% maximum Modified Proctor dry density (ASTM 1557) at +-2% optimum moisture content.

Add Subsection 621.055 “**Muck Excavation and Replacement**”

Where excavation to the finished grade or subgrade results in a subgrade consisting of unsuitable saturated soil, the ***Engineer*** may require the ***Contractor*** to remove and replace the unsuitable material with approved material compacted in a maximum of 8-inch loose lifts to a minimum of 95% maximum dry density Modified Proctor (ASTM 1557) at +/- 2% optimum moisture content to re-establish the finished grade or sub-grade. Unstable material shall be removed from the project site and disposed of by the ***Contractor***. Muck Excavation and Replacement will not be paid for separately but will be considered incidental to the bid item that it is associated with.

Modify Subsection 622.03 to reflect the Following:

Site-specific Construction Considerations, including but not limited to compaction requirements, from the project Geotechnical Evaluation Report shall supersede requirements from this section where they are in conflict.

Under Subsection 622.03 Add the Following:

When completing construction during wet or cold weather, grade the site such that surface water can drain readily away from the work areas. Promptly pump out or otherwise remove any water that may accumulate in excavations or on subgrade surfaces and allow these areas to dry before resuming construction. The use of berms, ditches and similar means may be used to prevent stormwater from entering the work area and to convey any water off site efficiently.

If earthwork is performed during the winter months when freezing is a factor, no grading fill, structural fill or other fill should be placed on frozen ground, nor should frozen material be placed as fill. Frozen ground should be allowed to thaw or be completely removed prior to placement of fill. A good practice is to cover the compacted fill with a “blanket” of loose fill to help prevent the compacted fill from freezing.

If structures are erected during cold weather, foundations or other concrete elements should not be constructed on frozen soil. Frozen soil should be completely removed from beneath the concrete elements, or thawed, scarified and recompacted. The amount of time passing between excavation or subgrade preparation and placing concrete should be minimized during freezing conditions to prevent the prepared soils from freezing. The use of blankets, soil cover or heating as required may be utilized to prevent the subgrade from freezing.

Excavation or Embankment (Fill) work either completed or in a stage of completion that is either eroded or washed away or becomes unstable due to either rains, snow, snow melt, channel flows

or lack of proper water control shall be either removed and replaced, re-compacted or reshaped as directed by the ***Engineer*** and in accordance with the Drawings and Specifications at ***Contractor's*** sole expense. Removed unsuitable materials shall be hauled away and disposed of at ***Contractor's*** expense. Placing of replacement materials for removed unsuitable materials shall be purchased, placed and compacted at ***Contractor's*** expense. All embankment fill material shall be compacted in a maximum of 8-inch loose lifts to a minimum of 95% maximum dry density modified proctor per ASTM 1557. Moisture content shall be within a range of ±2% optimum moisture content.

Subgrade should be prepared as described in Section 4.2.2 of the project Geotechnical Evaluation Report. Probing with a steel rod will be required to verify stable foundation material, if designated on the Drawings or when ordered by the ***Engineer***. Areas found to be soft and/or unstable and those areas which failed shall be ripped, scarified, wetted if necessary, and re-compacted to the requirements for density and moisture at ***Contractor's*** expense.

Probing shall be done with equipment and in a manner acceptable to the ***Engineer***. Probing as ordered by the ***Engineer*** shall not be measured and paid for separately but shall be included in the unit prices bid for the work.

Under Subsection 622.05

Modify section to reflect that testing shall be ordered and performed at the contractor's expense based upon the testing schedule Section 2.09 of the project Special Provisions. Quality Assurance testing may be ordered by the City and performed at the owner's expense.

- END OF SECTION -

REVISION OF SECTION 624 Riprap and Grouted Riprap Channel Construction

Replace Section 624 with the following.

ADDITION OF SECTION 624 – ROCK

Section 624 is hereby added to the Standard Specifications and shall include the following:

624.01 Description

The work of this section consists of installation of water control measures, subgrade preparation, riprap, and miscellaneous appurtenant items as indicated herein and on the Drawings.

The term “rock” includes all boulders, rip rap, core rock, cobble, and other types defined in section 624.02. The term “boulders” includes Surface Boulders, Rounded Surface Boulders, and Feature Boulders as determined in Section 626.02.

624.01.01SUBMITTALS AND TESTING:

A. General: Submittals shall be prepared and submitted in accordance with the Submittal Procedures.

B. In advance of delivery of imported rock to the work site an inspection of the quarry or source of any imported rock shall be arranged by the Contractor and shall include the Contractor, Engineer, and Quarry Representative.

C. Rock Work Plan: The Contractor shall prepare a Rock Work Plan for the project. The plan shall provide the Contractor’s methods and procedures for managing the sourcing, supply, stockpiling, delivery, and installation of rock work for the project including the following:

1. Rock shall be imported from a quarry. Identify material sources and expected quantities for each type of rock. Estimated quantities will be made at the earliest time practicable for each area to be constructed, and the Rock Work Plan will be updated or amended to reflect quantities.

   For each type of imported rock, include certificates stating the source of the rock and that the rock will meet the requirements of this section. Include test results for specific gravity, abrasion, gradation and freeze thaw on samples of rock to be supplied on this project.

2. The Contractor and quarry or rock supplier shall identify procedures that will be used to stockpile, mix and grade the types of riprap and boulders specified.

3. Sketches or exhibits indicating material stockpile and staging areas.

4. Describe methodologies and techniques for installation of each rock type.

624.02 MATERIALS

624.02.01 ROCK:

A. General: Rock shall be imported. Imported rock shall be derived from offsite sources such as quarries, pits excavations, or surface sources. All rock must be screened and/or sorted and

stockpiled into the various rock types to be used on the project. Graded materials shall be stockpiled in a manner to avoid segregation.

All rock and boulders are to be sound and durable against disintegration under conditions to be met in handling and placing. Rock and boulders shall be hard and tenacious and otherwise of a suitable quality to ensure permanency in the specified kind of work. Rock and boulders shall be free of calcite intrusions, cracks, joints, and other defects that could promote accelerated weathering and deterioration of the rock. Rhyolite rock shall not be allowed.

The color of imported boulders and riprap (other than Core Rock) shall match closely with existing rock in the project site as approved by the Engineer. Color shall be consistent on the entire PROJECT and shall match the color of rock to be used for all other portions of the WORK.

For Rip Rap and Core Rock, each rock/boulder shall have its greatest dimensions not greater than 3 times its least dimension.

All rock and boulders shall conform to the following test requirements of the American Society for Testing Materials (ASTM) and American Association of State Highway and Transportation Officials (AASHTO) Standards:

	Requirement	Testing Standard
Apparent Specific Gravity	2.60 minimum	ASTM C-127
Abrasion Loss	40% maximum	ASTM C-535
Freeze Thaw Loss	10% maximum after 12 cycles	AASHTO 103 Procedure A

All rock and boulders to be used on the project must be approved by the Engineer. Once approved, the rock shall be kept consistent through the project. No change may be made to the rock source unless specifically approved by the Engineer.

B. TYPES: The following types of rock shall be imported for this project.

1. Surface Boulders. To be used for grouted boulder or loose boulder installations in areas where smoothness or aesthetics of finished rock work is desired. The minimum size of surface boulders to be used on this project is shown on the Drawings or details but shall be at least 36-inches in all dimensions.

2. Riprap: Imported rock meeting the following gradation:

CLASSIFICATION OF GRADATION OF ORDINARY RIPRAP (IMPORTED)

Riprap Designation	% Smaller than Given Size by Weight	Intermediate Rock Dimensions (inches)	d_{50} (inches)*
Type VL	**70 - 100** **50 – 70** **35 – 50** **2-10**	**12** **9** **6** **2**	**6**
Type L	**70 – 100** **50 – 70** **35 – 50** **2 – 10**	**15** **12** **9** **3**	**9**
Type M	**70 – 100** **50 – 70** **35 – 50** **2 – 10**	**21** **18** **12** **4**	**12**
Type H	**70 – 100** **50 – 70**	**30** **24**	

Riprap Designation	% Smaller than Given Size by Weight	Intermediate Rock Dimensions (inches)	d_{50} (inches)*
	35 – 50 **2 – 10**	**18** **6**	**18**
Type VH	**70 – 100** **50 – 70** **35 – 50** **2 – 10**	**42** **33** **24** **9**	**24**

* d_{50} = Mean Particle Size

3. Additional Requirements for Rip Rap:
   a. Each load of riprap shall be reasonably well graded from the smallest to the largest size specified.
   b. Stones smaller than the two to ten percent (2 - 10%) size will not be permitted in an amount exceeding ten percent (10%) by weight of each load.
   c. Control of gradation shall be by visual inspection. However, in the event ENGINEER determines the riprap to be unacceptable, ENGINEER shall pick two (2) random truckloads to be dumped and checked for gradation.
      i. Mechanical equipment and labor needed to assist in checking gradation shall be provided by CONTRACTOR at no additional cost.
   d. Unless otherwise noted on the Drawings, riprap shall be placed in the following minimum thickness (not including bedding thickness as applicable):

Riprap Designation	Riprap Layer Thickness (inches)
Type VL	12
Type L	18
Type M	24
Type H	36
Type VH	48

4. Granular Bedding Material: Granular bedding designation and total thickness of bedding shall be as shown on the Drawings. Granular bedding shall meet the same requirements for specific gravity, absorption, abrasion, sodium sulfate soundness, and freeze – that durability as required for riprap and specified above.

   Gradation for Granular Bedding:

	Percent Weight by Passing Square-Mesh Sieves	
U.S. Standard Sieve Size	Type I (CDOT)	Type II (CDOT)
3-inch	-	90 – 100
1-1/2 inch	-	-
3/4 inch	-	20 – 90
3/8 inch	100	-
No. 4	95 – 100	0 – 20
No. 16	45 – 80	-
No. 50	10 – 30	-
No. 100	2 – 10	-
No. 200	0 – 2	0 - 3

C. QUALITY CONTROL: The Contractor shall manage the delivery and stockpiling of rock at the site to assure that adequate supply of rock meeting the specification is available for installation when required. Stockpile locations shall be arranged to avoid interference with other project

operations. Rock which does not meet specifications or is not installed shall be removed from the site.

624.02.02 SOIL RIPRAP:

A. Rock requirements are to comply with riprap as specified in Part 2.01 Rock.

B. Soil riprap shall be placed in the minimum thicknesses as noted on the Drawing plans, details, and sections.

C. The soil material shall be native or imported topsoil and mixed with sixty-five percent (65%) riprap and thirty five percent (35%) soil by volume.

D. Unless specified elsewhere, seed for buried riprap shall consist of a mix of native grasses as proposed by a local, well qualified supplier. Rates and application will be as recommended by the supplier.

624.02.03 VOID-PERMEATED RIPRAP:

Void-Permeated Riprap differs from Soil Riprap and Void-Filled Riprap in that most of the voids are filled after placement of the riprap layer. The material to be washed into the voids shall be referred to as permeate material.

A. Rock requirements are to comply with riprap material specifications in Part 2.01 Rock.
B. Samples of riprap and permeate material shall be submitted for the review and approval of the ENGINEER prior to construction.
C. Where "Void-Permeated Riprap" is designated on the Drawings, Initially Placed Riprap rock components shall be mixed prior to placing each layer of riprap.
D. Permeate material shall consist of sands, rounded gravels, and rounded river cobbles. Void permeate materials shall meet the graduation requirements specified in the following table. If permeate materials are harvested on-site, the material shall be well mixed and stockpiled on site with the gradation of the permeate material visually approximated and agreed upon with the Engineer. If agreement cannot be reached, a sample shall be taken and the gradation shall be established.
E. Void-permeated riprap shall be placed in the minimum thicknesses as noted on the Drawing plans, details, and sections. The materials required for each step in the placement procedure include:

Approximate Proportions	Material Type	Material Description
Initially Placed Riprap		
75-90% of Initially Placed Riprap	Riprap	Type VL, L, M, or H as Indicated on Drawings

10-25% of Initially Placed Riprap	Pit Run well mixed and placed with riprap or: VTC (Vehicle Tracking Control rock)	4-inch minus pit run surge (round river rock and sand, well graded, 90-100% passing 4-inch sieve, 70-80% passing 1.5-inch sieve, 0 -60% passing 3/8-inch sieve, 10-30% passing #16 sieve). or: VTC (Vehicle Tracking Control) rock (crushed rock with 100% passing 4-inch sieve, 50-70% passing 3-inch sieve, 0-10% passing 2-inch sieve)
Permeate Material (To be Washed into Voids after Initial Placement)		
25%	Permeate material	2 to 4-inch cobble (round washed river rock that is well-graded, 100% passing 6-inch sieve, 35-50% passing 3-inch sieve, 5-20% passing 2-inch sieve)
25%	Permeate material	4-inch minus pit run surge (round river rock and sand, well graded, 90-100% passing 4-inch sieve, 70-80% passing 1.5-inch sieve, 40-60%passing 3/8-inch sieve, 10-30% passing #16 sieve) or: VTC (Vehicle Tracking Control) rock (crushed rock with 100% passing 4-inch sieve, 50-70% passing 3-inch sieve, 0-10% passing 2-inch sieve)
50%	Permeate Material	Harvested sands and gravels collected from locations identified on site or 2:1 sand:squeegee mix.
Material Placed on top of Riprap Layer after Plating		
Top layer	Top dressing	Same as the permeate material.

* Percentage used shall be based upon mixing samples made prior to placement of riprap as determined by the Engineer. The Contractor shall prepare four samples of at least two cubic yards each. The Engineer shall inspect each sample and determine new mix percentages for next trial sample.

Void-permeated riprap shall be placed in the minimum thicknesses as noted on the Drawing plans, details, and sections.

624.02.04 FILTER FABRIC:

Use Mirafi 140 N non-woven filter fabric or engineer-approved equal where shown on the Drawings.

624.03 EXECUTION

624.03.01 SUBGRADE PREPARATION:

A. WATER CONTROL: Prior to commencing work on rock placement, install water control measures as required to perform work in dry conditions. Water control measures shall include, but are not limited to, diversions, sumps with pumps or other means necessary to maintain the level of groundwater below subgrade elevation and to divert surface water away from the work area. The Contractor is responsible for investigating and understanding all site conditions that may affect the work, including surface water, level of groundwater and time of year the work is to be done. By submitting a bid, the Contractor acknowledges that such investigations have been made and consideration of such conditions are a part of the Contractor's bid.

B. SUBGRADE PREPARATION FOR RIPRAP: Excavate for placement of rock as indicated, providing a firm smooth compacted uniform surface at the proper grade. The subgrade shall be free of brush, trees, stumps, and other objectionable material. If unsuitable materials are encountered, they shall be removed and replaced in accordance with Section 621 – Channel Excavation, for subgrade that has been excavated in undisturbed soil. The subgrade shall be undisturbed native material, unless in fill areas or as otherwise shown on the Drawings. Excavation and subgrade shall at a minimum meet the requirements of Sections 621 -Channel Excavation and 622 – Channel Embankment and Backfill. In fill areas under riprap and non-grouted boulders, the subgrade is to be compacted to 95 percent maximum density (ASTM D698) or to 70 percent of its maximum relative density (ASTM D2049). In fill areas under or otherwise supporting grouted rock or sculpted concrete, the subgrade shall meet the stricter requirements of Subgrade under Structures as specified in Sections 621 – Channel Excavation and 622 – Channel Embankment and Backfill. Subgrade elevation and compaction shall be verified by the Engineer prior to placement of riprap or boulders.

   For riprap areas, after an acceptable subgrade is established, geotextile and/or bedding material shall be immediately placed and leveled to the specified elevation shown on the DRAWINGS. Immediately following the placement of the bedding material, the riprap shall be placed. If bedding material is disturbed for any reason, it shall be replaced and graded at CONTRACTOR's expense. In-place bedding materials shall not be contaminated with soils, debris or vegetation before the riprap is placed. If contaminated, the bedding material shall be removed and replaced at CONTRACTOR's expense. If a scarified subgrade is required, the subgrade shall be prepared and compacted to the elevations required as specified or shown for riprap. Afterwards, the surface shall be uniformly scarified to the depths required using sufficiently sized equipment. Tractors, bulldozers, or similar equipment shall pull a tillage implement or be fitted with a tool bar containing tines, rippers or other devices capable of loosening and mixing the soil to the required depth. Other methods may be acceptable if approved by the Engineer.

624.03.02 RIPRAP PLACEMENT:

A. Install water control measures. Prepare subgrade and machine place stones into position following details on Drawings. Arrange as necessary by machine or by hand to interlock. The finished area shall be well graded and free from objectionable pockets of small stones and clusters of larger stones. Dumping and/or backhoe placement alone is not sufficient to ensure proper interlocked placement. The basic procedure shall result in larger materials flush to the top surface with faces and shapes arranged to minimize voids, and smaller material below and between larger material. Surface grades will be a plane or as indicated on drawings, but projections above or depressions under the finished design grade more than 10% of the rock layer thickness will not be allowed. Smaller rock shall be securely locked between the larger stone. It is essential that the material between the larger stones is not loose, or easily displaced by flow or by vandalism. The stone will be consolidated by the bucket of the backhoe or other means that will cause interlocking of the material. The outside edges of the material are to be uniform and free from bulges, humps, or cavities. All rock is to be placed in a dewatered condition beginning at the toe of the slope or other lowest point unless otherwise specified in the Drawings or Specifications. Riprap shall be placed to full course thickness in one operation and in such a manner as to avoid displacing the underlying bedding material. Placing of riprap in layers, or by dumping into chutes, or by similar methods shall not be permitted.

624.03.03 SOIL RIPRAP:

A. Adjacent stockpiles of riprap and soil shall be created and mixing done at the stockpile location, not at the location where soil riprap is to be placed

B. Mix thirty-five percent (35%) soil by volume with stockpiled riprap, using additional moisture and control procedures that ensure a homogenous mixture, where the soil fills the inherent voids in the riprap without displacing riprap.

C. With prior approval of Engineer, layering the riprap and soil instead of premixing may be allowed if the native soil is granular.

D. Place a first layer of smaller soil riprap of approximate d50 thickness. Then place the top layer with surface rocks that are largely d50 or greater, filling voids as necessary with smaller riprap. Create a smooth plane as described in Part 3.03 Riprap Placement.

E. The mixture shall be consolidated by large vibratory equipment or backhoe bucket to create a tight, dense interlocking mass.

F. The soil shall be further wetted to encourage void filling with soil.

G. Any large voids shall be filled with rock and small voids filled with soil.

H. Excessively thick zones of soil prone to washing away shall not be created (for example, no thicknesses greater than six (6) inches).

I. Where indicated on the Drawings as exposed or not designated as buried, the final surface shall be thoroughly wetted for good compaction, smoothed, and compacted by vibrating equipment; the surface shall then be hand raked to receive planting or seeding. Hand broadcast seed mix and mulch as specified and shown on the drawings Final grade shall be covered with erosion control blanket and secured with biodegradable stakes.

J. Where indicated on the Drawings as subsurface, the final surface shall be thoroughly wetted for good compaction, smoothed, and compacted by vibrating equipment; the surface shall then be hand raked to receive geotextile and granite sand aggregate.

624.03.04 VOID-PERMEATED RIPRAP:

A. Void-permeated Riprap is riprap meeting other material and installation requirements specified elsewhere in this specification with the following additional material and installation requirements:

B. Follow requirements of 3.01 SUBGRADE PREPARATION, and 3.02 RIPRAP PLACEMENT except as modified herein.

C. Scarify upper layer of prepared subgrade to facilitate plating of riprap.

D. Place bedding if required on details.

E. Approved individual component materials of the initially placed riprap shall be delivered to site in separate marked stockpiles. Mixing shall be accomplished using a front-end loader or other approved means to add the specified percentages of each material to a mixing stockpile. Avoid picking up native soil from the subgrade under the stockpiled materials during the loader bucket mixing operations.

F. Place riprap as specified and shown on the drawings in equally deep lifts no thicker than 15-inches.

G. Wash and rod Permeate Material into riprap by evenly placing material with water on top of the riprap and dumping loader or backhoe buckets of water over the Permeate Material and riprap. Continue washing the Void Permeated Material until more material will not wash into the riprap.

H. Repeat the placement and washing and rodding of the Permeate Material of the next layer of riprap until the design thickness is obtained.

I. For the top layer of riprap: distribute and flatten riprap to a relatively uniform surface using a backhoe bucket or other approved means following a definite pattern, with the voids between the larger stones filled with the Void Permeated Material.

J. Plating of Riprap: Plated (also referred to as keyed riprap), is mechanically placed riprap that has been keyed in place by slapping the surface with a large piece of armor plating that is repeatedly dropped. A 5000-pound steel plate (approximately 4' x 5' x 6") is used to compact the rock into a tight mass and to smooth the rock surface. The plate need only be dropped approximately 3 to 4 feet to be effective.

   a. Plating is complete when striking action has resulted in a reasonably uniform surface, true to the dimensions shown in the plans, and the tops of the rocks have less than 1-1/2-inches of variation.

   b. If approved by the Engineer and adequate performance is demonstrated, a backhoe equivalent or larger than a 235C Caterpillar excavator with a vibratory hydraulic plate compactor weighing at least 1,700 pounds and creating an impulse force of at least 18,000 lbs at a frequency of 2100 cpm or greater or full loading of an excavator bucket, can be used in place of the repeatedly dropped armored plate method. Plating is complete after all areas are compacted for at least 30 seconds and as specified above.

K. After plated surface is accepted, fill remaining surface voids (1 to 3 inches) with the top dressing to the finished grade.

- END OF SECTION -

ADDITION OF SECTION 626 – ARTICULATED CONCRETE MAT

Section 626 is hereby added to the Standard Specifications and shall include the following:

626.01 DESCRIPTION

A Tied Concrete Block Mat with Triple Layered Underlayment. This work shall consist of furnishing and placing the system in accordance with this specification and conforming with the lines, grades, design, and dimensions shown on the plans.

626.02 MATERIALS

Articulated concrete mat shall be manufactured from individual concrete blocks tied together with high strength knitted polypropylene bi-axial geogrid. Each block shall be tapered, beveled and interlocked and include connections that prevent lateral displacement of the blocks within the mats when they are lifted for placement.

626.02.01 Blocks. Furnish blocks manufactured with concrete conforming to the cement requirements of ASTM C150 and to the aggregate requirements of ASTM C33. Blocks shall have a minimum weight of 3 lb. per block and placed no further than 2 in. apart. Material weight per square foot shall not exceed 10 lbs. Blocks shall have a 2.25" profile, a flat-top pyramid shape, and a coarse finish without protrusions. Concrete shall have a minimum compressive strength requirement of Table1 and certified by a third party.

Table 1 Concrete Compressive Strength Requirements

Age	Required Compressive Strength psi
7 - Day	5000 psi
14 – Day	6000 psi
28 - Day	6900 psi

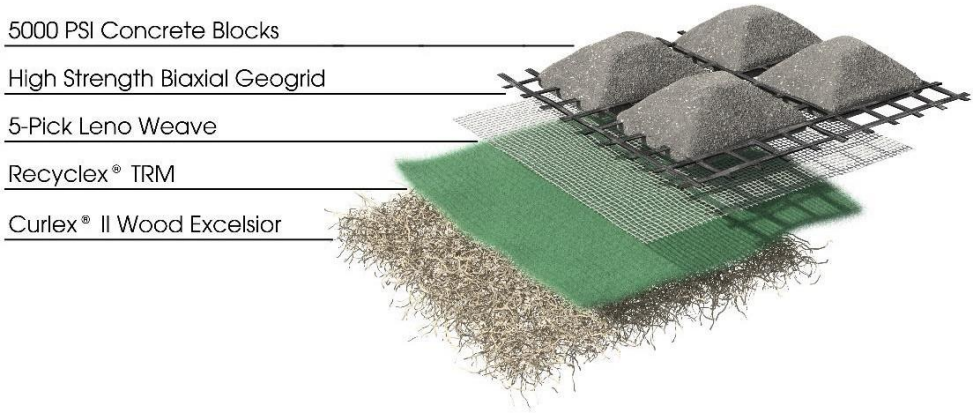
626.02.02 Polypropylene Bi-Axial Geogrid. The interlocking geogrid shall be an open knitted fabric composed of high tenacity, multifilament polypropylene yarns knitted and coated in tension with an acrylic based coating which is designed to resist degradation in environments with exposure to water and low pH (,4 pH) and high pH (>9 pH). When combined with the revetment mat, this will yield a high tenacity, low elongating, and continuous filament polypropylene geogrid that is embedded within the base of the concrete blocks. Ensure the geogrid meets the requirements of Table 2.

Table 2 Polypropylene Bi-Axial Geogrid

Property	Unit	Test	Requirement
Mass/Unit Area	oz/yd^2	ASTM D5261	6.5 oz/yd^2
Aperture Size	English units	Measured	1.4x 1.4 inch
Ultimate Wide Width Tensile Strength (MD x CMD)	lb/ft	ASTM D6637	2,055 lb/ft
Elongation at Ultimate Tensile Strength (MD x CMD)	%	ASTM D6637	6%
Wide Width Tensile Strength @ 2% (MD x CMD)	lb/ft	ASTM D6637	822 lb/ft
Wide Width Tensile Strength @ 5% (MD x	lb/ft	ASTM	1,640 lb/ft

CMD)		D6637	
Tensile Modulus @ 2% (MD x CMD)	lb/ft	ASTM D6637	41,100 lb/ft
Tensile Modulus @ 5% (MD x CMD)	lb/ft	ASTM D6637	32,800 lb/ft

626.02.03 Underlayment Materials. A four-layered system includes, in order from top to bottom, 1) Concrete block mat 2) 5-Pick Leno Weave 3) Recyclex TRM-V and 4) Curlex® II. The underlayment materials shall be packaged within the roll of the Flexamat Plus.



FIVE-PICK LENO WEAVE:

This Five-Pick Weave provides added strength and support to the underlayments.

Index Property	Units	Value
GSM	g/m²	118 (-3 ¯ +3)
Density	Picks/10cm	62 x 24 (+/- 2)
Warp Strength	N/5cm	≥ 350
Warp Elongation	%	20 - 50
Weft Strength	N/5cm	≥ 280
Weft Elongation	%	20 - 50
Warp Shrinkage	%	≤ 7
Weft Shrinkage	%	≤ 9

RECYCLEX® TRM:

Recyclex TRM – V is a permanent non-degradable Turf Reinforcement Mat (TRM), consists of 100% post-consumer recycled polyester (green or brown bottles) with 80% five-inch fibers or greater fiber length. It is of consistent thickness with fibers evenly distributed throughout the entire area of the TRM. The top and bottom of each TRM is covered with heavy duty polypropylene net. Fibers are tightly crimped and curled to allow fiber interlock, and to retain 95% memory of the original shape after loading by hydraulic events. Fibers have a specific gravity greater than 1.0; therefore, the blanket will not float during hydraulic events. Recyclex TRM – V meets Federal Government Executive Order initiatives for use of products made from, or incorporating, recycled materials. Recyclex TRM – V shall be manufactured in the U.S.A. and the fibers shall be made from 100% recycled post-consumer goods.

INDEX PROPERTY	TEST METHOD	VALUE
Thickness	ASTM D 6525	0.294 in (7.47 mm)
Light Penetration	ASTM D 6567	57%

Resiliency	ASTM D 6524	86%
Mass per Unit Area	ASTM D 6566	0.50 lb/yd^2 (271 g/m^2)
MD-Tensile Strength Max.	ASTM D 6818	295.2 lb/ft (4.32 kN/m)
TD-Tensile Strength Max.	ASTM D 6818	194.4 lb/ft (2.85 kN/m)
MD-Elongation	ASTM D 6818	32.2%
TD-Elongation	ASTM D 6818	40.8%
Swell	ECTC Procedure	8%
Water Absorption	ASTM D 1117/ECTC	33.8%
Specific Gravity	ASTM D 792	1.21
UV Stability	ASTM D 4355 (1,000 hr)	80% minimum
Porosity	Calculated	97.5%
Bench-Scale Rain Splash	ECTC Method 2	SLR = 5.86 @ 2 in/hr [1,2]
Bench-Scale Rain Splash	ECTC Method 2	SLR = 5.00 @ 4 in/hr [1,2]
Bench-Scale Rain Splash	ECTC Method 2	SLR = 6.33 @ 6 in/hr [1,2]
Bench-Scale Shear	ECTC Method 3	2.41 lb/ft^2 @ 0.5 in soil loss [2]
Germination Improvement	ECTC Method 4	432%

[1] SLR is the Soil Loss Ratio, as reported by NTPEP/AASHTO. [2] Bench-scale index values should not be used for design purposes

CURLEX® II:

Curlex II erosion control blanket (ECB) consists of a specific cut of naturally seed free Great Lakes Aspen curled wood excelsior with 80% six-inch fibers or greater fiber length. It is of consistent thickness with fibers evenly distributed throughout the entire area of the blanket. The top and bottom of each blanket is covered with degradable polypropylene netting.

INDEX PROPERTY	TEST METHOD	VALUE
Thickness	ASTM D 6525	0.418 in (10.62 mm)
Light Penetration	ASTM D 6567	34.6%
Resiliency	ASTM D 6524	64%
Mass per Unit Area	ASTM D 6475	0.57 lb/yd^2 (309 g/m^2)
MD-Tensile Strength Max.	ASTM D 6818	127.0 lb/ft (1.9 kN/m)
TD-Tensile Strength Max.	ASTM D 6818	50.9 lb/ft (0.7 kN/m)
MD-Elongation	ASTM D 6818	28.64%
TD-Elongation	ASTM D 6818	29.84%
Swell	ECTC Procedure	89%
Water Absorption	ASTM D 1117/ECTC	199%
Bench-Scale Rain Splash	ECTC Method 2	SLR = 6.84 @ 2 in/hr [2,3]
Bench-Scale Rain Splash	ECTC Method 2	SLR = 7.19 @ 4 in/hr [2,3]
Bench-Scale Rain Splash	ECTC Method 2	SLR = 7.56 @ 6 in/hr [2,3]
Bench-Scale Shear	ECTC Method 3	2.6 lb/ft^2 @ 0.5 in soil loss [3]
Germination Improvement	ECTC Method 4	645%

[1] Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen excelsior is 22%.

[2] SLR is the Soil Loss Ratio, as reported by NTPEP/AASHTO. [3] Bench-scale index values should not be used for design purposes.

626.02.04 Mats will be rolled for shipment. Upon delivery, rolls may be left exposed for up to 30 days. If exposure will exceed 30 days, cover or tarp the rolls to minimize UV exposure.

Chipping or missing concrete resulting in a weight loss exceeding 15% of the average weight of a concrete unit is grounds for rejection by the engineer. Replace, repair or patch the damaged areas per the manufacturer's recommendations.

626.03 PERFORMANCE

Full-Scale laboratory testing performed by an independent 3rd party testing facility with associated engineered calculations certifying the hydraulic capacity of the proposed Tied-Concrete Block Erosion Control Mat meets the following requirements:

Test	Tested Value	Bed Slope	Soil Classification	Limiting Value
ASTM 6460	Shear Stress	30%	Sandy Loam (USDA)	24lb./ft2
ASTM 6460	Velocity	20%	Loam (USDA)	30 t./sec

626.04 ALTERNATIVE PRODUCTS

Such products must be pre-approved in writing by the Engineer prior to bid date. Alternative product packages must be submitted to the Engineer a minimum of fifteen (45) days prior to bid date. Submittal packages for alternate products must include, as a minimum, the following:

626.04.01 Alternative Product Properties – Product must be comprised of materials as detailed in Section 2, including both in composition, underlayment layers and performance requirements.

626.04.02 Full-Scale laboratory testing performed by an independent 3rd party testing facility with associated engineered calculations certifying the hydraulic capacity of the proposed Tied-Concrete Block Erosion Control Mat meets the performance requirements listed in Section 3 of this specification.

626.04.03 A list of 15 comparable projects in terms of project size, application and material dimensions in the United States, where the results of the specific alternative material's use can be verified and reviewed for system integrity and sustained after a minimum of 10 years of service life.

626.05 EQUIPMENT

Provide the proper equipment to place the mat that will not damage the mat material or disturb the topsoil subgrade and seed bed.

626.06 CONSTRUCTION

Prior to installing Flexamat Plus, prepare the subgrade as detailed in the plans. All subgrade surfaces to be smooth and free of all rocks, stones, sticks, roots, and other protrusions or debris of any kind that would result in an individual block being raised more than 3/4 in. above the adjoining blocks. When seeding is shown on the plans, provide subgrade material that can sustain growth.

Ensure the prepared subgrade provides a smooth, firm, and unyielding foundation for the mats. The subgrade shall be graded into a parabolic or trapezoidal shape to concentrate flow to middle of mat or mats.

When vegetation is required, distribute seed on the prepared topsoil subgrade before installation of the concrete mats in accordance with the specifications.

Install mats to the line and grade shown on the plans and per the manufacturer's guidelines. The manufacturer or authorized representative will provide technical assistance during preparation and installation of the concrete block mats as needed.

Provide a minimum 18 in. deep concrete mat embedment toe trench at all edges exposed to concentrated flows. Recess exterior edges subject to sheet flow a minimum of 6 in.

Provide fastening or anchoring as recommended by the manufacturer or engineer for the site conditions.

- END OF SECTION -

ADDITION OF SECTION 627 – MOBILIZATION

Section 627 is hereby added to the Standard Specifications and shall include the following:

627.01 Description

Mobilization and Demobilization shall consist of the preparatory work and operations in mobilizing for beginning work on the Project and demobilizing at the end of construction. This work shall include, but not be limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to the Project Site, and for the establishment of temporary offices, building facilities, utilities, testing laboratories, safety equipment and first aid supplies, sanitary and other facilities, as required by these Specifications, and State and local laws and regulations. The costs of bonds, plans, permits and any required insurance and other pre-construction expense necessary for the start of the work, excluding the cost of construction materials, shall also be included in this item.

REVISION OF SECTION 636 CONSTRUCTION REQUIREMENTS FOR MANHOLES, JUNCTION BOXES, CAST IN PLACE REINFORCED CONCRETE BOX, INLETS, PIPE END FINISH AND FITTINGS

Section 636 of the Standard Specifications is hereby revised as follows:

Under Subsection 636.01, add the following:

A. Pipe Connections:

1. The manhole shall be thoroughly bonded to the barrel of the pipe and all connections with pipe shall be made without projections or voids.

2. All HDPE pipes shall have a Press-Seal Corporation HDPE WaterStop or approved equal applied around the pipe.

3. The joint between the pipe and manhole wall shall be sealed with a non- shrink grout.

ADDITION OF SECTION 640 – STRUCTURAL STEEL, MISCELLANEOUS METALWORK, AND EMBEDMENTS

Section 640 is hereby added to the Standard Specifications and shall include the following:

640.1 GENERAL

640.1.1 DESCRIPTION:

A. This Section includes furnishing all materials, fabrication, and installation of structural steel, miscellaneous metalwork, and embedded metalwork including the stop logs for the project.

640.1.1 DESIGN CRITERIA:

A. Structural Connections and Framing: AISC Specification for Structural Steel Buildings.

640.1.2 **SUBMITTALS:**

A. Submit the following. All submittals shall be made in accordance with Project Special Provisions Section 2.22.

1. Submit drawings detailing fabrication and erection of each metal fabrication indicated. Reproductions of drawings will not be accepted for this purpose.

    a. Include plans, elevations, sections and details of metal fabrications and their connections. Show anchorage and accessory items.

    b. Indicate welded connections using standard AWS welding symbols. Clearly indicate net weld lengths, sizes and welding sequences.

2. Provide manufacturer's data sheets, handling and installation instructions for concrete anchors.

640.2 PRODUCTS

640.2.1 MATERIALS:

640.2.2 Unless otherwise indicated, materials shall meet the requirements in Table 1 and the following paragraphs:

Table 1 Structural Steel, Miscellaneous Metalwork, and Embedments

ITEM	SPECIFICATION
Structural Steel Shapes and Plates:	
Steel Plate for Lifting Lugs	ASTM A 242
Wide Flange Shapes	ASTM A 992, Grade 50
Other Rolled Shapes, Bars and Plates	ASTM A 36
Structural Steel Tubing (HSS):	
Round Shapes ($t \leq 0.625$ inch)	ASTM A 500, Grade B
Round Shapes ($t > 0.625$ inch)	ASTM A 53, Grade B
Square or Rectangular Shapes	ASTM A 500, Grade B
Steel Pipe	ASTM A 501 or A 53, Type E or S, Grade B
Stainless Steel:	
Bars and Shapes	ASTM A 276, AISI Type 316
Steel Plate, Sheet and Strip	ASTM A 240 or A 666, AISI Type 316
Bolts and Threaded Rods	ASTM A 193, AISI Type 316, B8M, B8MN, B8M2 or B8M3
Expansion Bolts	ASTM A 582, Type 303
Nuts	ASTM A 194, AISI Type 316, 8M, 8MN, 8M2 or 8M3
Steel Bolts, Nuts and Washers:	
Carbon Steel	ASTM A 307 or A 36
High-Strength	ASTM A 325, Type 1
Galvanized Steel Bolts and Nuts	ASTM A 307 or A 36, with ASTM A 153 zinc coating and ANSI B1.1
Machine Bolts	Federal Specification FF-B-575, Grade 5
Lag Bolts	ASME B18.21.1
Eyebolts	ASTM A 489
Threaded Rods	ASTM A 36
Flat Washers (Unhardened)	ASTM F 844; use A 153 zinc coating
Flat Washers (Hardened)	ASTM F 436

ITEM	SPECIFICATION
Lock Washers (Helical Spring Type, Carbon Steel)	Federal Specification FF-W-84A
Steel Sheet:	
Uncoated, Structural, Cold-Rolled	ASTM A 1008, Grade A, unless otherwise indicated or required by design loading
Uncoated, Nonstructural, Cold-Rolled	ASTM A 1008, Commercial Quality
Galvanized, Structural Quality	ASTM A 653, Grade A, unless otherwise required by design loading, with G-90 coating
Machine Screws, Cadmium Plated Steel	Federal Specification FF-S-92B
Aluminum Structural Shapes and Plates	ASTM B 209 and B 308, Alloy and Temper 6061-T6
Aluminum Bolts and Nuts	ASTM F 468 Alloy and Temper 2024-T4
Cast Iron	ASTM A 48, Class 35

640.2.3 Drilled Anchors:

640.2.3.1 Where indicated on the Drawings, drilled anchors shall be stainless-steel Titen HD screw anchors by Simpson Strong-Tie. Anchors shall have ICBO-approved testing.

640.2.3.2 Headed Anchor Studs: Headed anchor studs for embedded metalwork anchors shall be Nelson Stud Anchors or equal, and of the sizes shown on the Drawings.

640.2.4 Antiseizing Lubricant: Lubricant shall contain substantial amounts of molybdenum disulfide, graphite, mica, talc, or copper and shall be Permatex Antiseizing Lubricant by Loc Tite Co.; or equal. Apply to threads of stainless-steel bolts.

640.2.5 Welding Electrodes:

640.2.5.1 Welding electrodes for structural steel shall conform to AWS D1.1 Standards – AWS A5.1 or A 5.5 E70XX Series Electrodes.

640.2.5.2 Welding electrodes for aluminum shall be ER4043 filler metal.

640.2.5.3 Welding electrodes for stainless steel shall conform to AWS A5.4. Use electrodes E308 for Type 304 stainless steel and E316 for Type 316 stainless steel.

640.2.6 Stop Logs:

640.2.6.1 Stop logs shall be aluminum stop log Series 500 by Whipps, Inc.

640.3 EXECUTION

640.3.1 STORAGE OF MATERIALS:

640.3.1.1 Store material, either plain or fabricated, above ground on platforms, skids, or other supports. Keep materials free from dirt, grease, and other foreign matter and protect from corrosion.

640.3.2 FABRICATION AND ERECTION:

640.3.3 Fabricate miscellaneous metal items to straight lines and true curves. Drilling and punching shall not leave burrs or deformations.

640.3.4 Continuously weld permanent connections along the entire area of contact.

640.3.5 Exposed work shall have a smooth finish with welds ground smooth. Joints shall have a close fit with corner joints coped or mitered and shall be in true alignment. Unless specifically indicated on the Drawings, there shall be no bends, twists, or open joints in any finished member nor any projecting edges or corners at intersections.

640.3.6 Conceal fastenings wherever possible. Built-up parts shall be free of warp. Exposed ends and edges of metal shall be slightly rounded.

640.3.7 Clean the surfaces of metalwork to be in contact with concrete of rust, dirt, grease and other foreign substances before placing concrete.

640.3.8 Set embedded metalwork accurately in position when concrete is placed and support rigidly to prevent displacement or undue vibration during or after the placement of concrete. Unless otherwise specified, where metalwork is to be installed in recesses in formed concrete, said recesses shall be made, metalwork installed, and recesses filled with non-shrink grout in conformance with Section 600.02.03.C.

640.3.9 PAINTING:

640.3.9.1 All steel shall be painted with a electrostatic paint. The paint and its color shall be Federal Standard 14062 Dark Green and approved by the City. The surface preparation for the steel and shop coating shall be as recommended by the paint manufacturer.

640.3.10 WELDING:

640.3.10.1 Perform welding on steel by the shielded metal arc welding (SMAW) process. Welding shall conform to the AWS Structural Welding Code-Steel, D1.1, except as modified in AISC Section J2.

640.3.10.2 Perform welding on aluminum by the gas metal arc (MIG) or gas tungsten arc (TIG) process. Welding shall conform to the AWS Structural Welding Code-Aluminum, D1.2.

640.3.10.3 Perform welding on stainless steel by the gas tungsten arc (TIG) process. All welds shall be full penetration and smooth unless otherwise indicated on the Drawings. Provide inert gas on the inside of pipe during welding to reduce oxidation.

640.3.10.4 Provide a minimum of two passes for metal in excess of 5/16-inch thickness.

640.3.10.5 Produce weld uniform in width and size throughout its length with each layer of weldment smooth; free of slag, cracks, pinholes, and undercuttings; and completely fused to the adjacent weld beads and base metal. Avoid irregular surface, nonuniform bead pattern, and high crown.

Form fillet welds of the indicated size of uniform height and fully penetrating. Accomplish repair, chipping, and grinding of welds in manner that will not gouge, groove, or reduce the base metal thickness.

640.3.11 INSTALLING BOLTS:

640.3.11.1 Bolts shall be of the length that will extend entirely through but not more than 1/4 inch beyond the nuts. Draw boltheads and nuts tight against the work. Tap boltheads with a hammer while the nut is being tightened.

640.3.12 INSTALLING ANCHOR BOLTS:

640.3.12.1 Preset bolts and anchors by the use of templates. For mechanical equipment, do not use concrete anchors set in holes drilled in the concrete after the concrete is placed.

640.3.12.2 For static items, use preset anchor bolts where shown on the Drawings or drilled anchors with ICBO report data.

640.3.12.3 After anchor bolts have been embedded, protect projecting threads by applying grease and having the nuts installed until the time of installation of the equipment or metalwork.

640.3.12.4 Minimum depth of embedment of drilled mechanical anchors shall be as recommended by the manufacturer, but no less than that shown on the Drawings and no less than six and one-half bolt diameters.

640.3.13 ANCHORING SYSTEMS FOR CONCRETE:

640.3.13.1 Begin installation only after concrete or masonry receiving anchors has attained design strength.

640.3.13.2 Do not install an anchor closer than six times its diameter to either an edge of concrete, or to another anchor, unless shown otherwise.

640.3.13.3 Install anchors in accordance with manufacturer's instructions. Hole diameters are critical to installation, use only drills recommended by anchor manufacturer.

640.3.13.4 Follow specific manufacturer's safe handling practices when handling and installing anchors.

640.3.14 CONTROL OF FLAME CUTTING:

640.3.14.1 Do not use a gas-cutting torch in the field for correcting fabrication errors on any member in structural framing. Use a gas-cutting torch only on minor members when the member is not under stress.

640.3.15 CORROSION PROTECTION OF ALUMINUM SURFACES:

640.3.15.1 Coat aluminum surfaces to be embedded or which will be in contact with concrete or grout with bituminous paint having a minimum volume solids of 68 percent coal-tar pitch based.

640.3.15.2 Prepare surfaces to be coated with solvent or steam cleaning per SSPC SP-1; do not use alkali cleaning. Then dust blast.

640.3.15.3 Prime coat: surfaces to be coated by application of a synthetic resin or epoxy primer to metal surface before application of bituminous coating.

640.3.15.4 Finish Coat: Two coats of bituminous coating, 12 mils each.

640.3.15.5 Products and Manufacturers: Super Service Black by Carboline, St. Louis, MO; Tnemec 46-465 by Tnemec, North Kansas City, MO; Intertuf 100 by International Paint, Inc., Houston TX; or equal.

640.3.15.6 Allow the coating to dry before the aluminum is placed in contact with the concrete.

640.3.15.7 Where aluminum surfaces come in contact with dissimilar metals, except stainless steel, keep the dissimilar metallic surfaces from direct contact by use of neoprene gaskets or washers.

- END OF SECTION -

ADDITION OF SECTION 650 – SELECTIVE SITE DEMOLITION

Section 650 is hereby added to the Standard Specifications and shall include the following:

650.1 GENERAL

650.1.1 DESCRIPTION:

A. This Section includes removal of structures and obstructions and selective demolition of concrete, miscellaneous metals and any other items required to complete the work in the Contract Documents.

650.1.2 SUBMITTALS:

A. Submit to the Engineer the proposed methods and operations of removal of structures and obstruction, demolition of structures and modifications prior to the start of work. Include in the schedule the coordination of shutoff, capping and continuation of utility service as required. All submittals shall be made in accordance with Project Special Provisions Section 2.22

650.1.3 DISPOSAL OF MATERAILS:

A. Removed materials shall become the property of the Contractor and shall be removed from the project site.

650.2 PRODUCTS (NOT USED)

650.3 EXECUTION

650.3.1 GENERAL

A. Perform removal and salvage work specified herein and indicated on the Drawings in a manner that will not damage parts of the existing systems not intended to be removed and parts that are to be removed and salvaged. Items to be salvaged, which are damaged by the Contractor, shall be repaired or replaced with new undamaged items at the expense of the Contractor and as approved by the Engineer.

B. If, in the opinion of the Engineer, the method of demolition used may endanger or damage parts of the existing systems to remain, parts of existing systems to be removed and reinstalled, or affect the satisfactory operation of the existing facilities, promptly change the method when so notified by the Engineer.

C. Blasting will not be allowed as a method of demolition.

D. Protect utilities and existing improvements that are not to be removed from injury or damage resulting from the Contractor's operation.

E. During demolition supply safeguards required by applicable codes or regulations, including warning signs and lights, barricades, and the like, for protection of the public and Contractor's employees.

F. Demolition shall comply with all federal, state and local regulations.

G. The Owner and the Engineer assume no responsibility for the actual condition of the structures and materials to be demolished or modified.

650.3.2 REMOVING EXISTING CONCRETE:

650.3.2.1 The concrete shall be removed in a manner acceptable to the Engineer.

650.3.2.2 In general remove materials as follows

650.3.2.2.1 Locate and identify reinforcing bars in concrete prior to drilling and cutting, and protect structural integrity of existing work.

650.3.2.2.2 Use removal methods that will not crack or structurally affect adjacent concrete construction.

650.3.2.2.3 Cut back concrete to clean, straight lines by saw cutting a minimum of 1-inch deep; remainder of concrete may be jack-hammered.

650.3.2.2.4 Where the cut end of concrete reinforcement or other metal embedded items are exposed by demolition that will not be protected by new concrete, coat the exposed surface with an epoxy paste or remove the exposed metal item 2” below the surface of the concrete and patch with a cement grout.

650.3.3 REMOVAL OF METALS:

650.3.3.1 Anchors or other metal embedded items exposed by demolition that will not be protected by new concrete, remove the exposed metal item 2” below the surface of the concrete and patch with a cement grout.

- END OF SECTION -

REVISION OF SECTION 900 - SEEDING, FERTILIZER, BLANKET AND MULCHING

Section 900 of the Standard Specifications are hereby amended as follows:

Subsection 900.01 is revised as follows:

Delete the first paragraph and replace with the following:

"This work shall consist of soil preparation; furnishing and drilling or sowing seed; mulching or blanketing the seeded areas in accordance with these specifications, accepted horticultural practice, and in reasonably close conformity with the locations and details shown on the plans or as designated. The seeded areas shall be the limit of work and areas disturbed by access, staging, and stockpiling."

Delete the last paragraph.

Subsection 900.02 is revised as follows:

Delete the seed mix shown in 900.02.A and replace with the following:

All seed mixes shall consist of certified seed varieties that are free of noxious weeds and have been tested for purity and germination within six (6) months of the planting date. Certification labels which indicate the species, purity, germination, weed content, origin, and test date shall be submitted for all seed materials. Refer to the DRAWINGS for the locations of the various seed mixes.

Dryland Seed Mix.

Scientific Name	Common Name	% of Mix	PLS lbs/Acre
Bouteloua gracilis	Blue Grama-Hachita	4.4	1.0
Pascopyrum smithii	Western Wheatgrass-Arriba	25.7	5.9
Bouteloua curtipendula	Sideoats Grama-Vaughn	9.2	2.1
Schizachyrium scoparium	Little Bluestem-Pastura	10.9	2.5
Oryzopsis hymenoides	Indian Ricegrass-Paloma	6.6	1.5
Nasella viridula	Green Needlegrass-Lodorm	10.9	2.5
Andropogon gerardii	Big Bluestem-Champ	5.3	1.2
Koeleria macrantha	Junegrass-VNS	0.7	0.15
Avena sativa 'Monida'	Oats-Monida	26.3	6.0
		100.0	**22.85**

Wetland/Riparian Seed Mix:

Scientific Name	Common Name	% of Mix	PLS lbs/Acre*
Carex nebrascensis	Nebraska sedge	5	0.5
Distichlis spicata	Inland saltgrass	10	1.0
Eleocharis palustris	Common spike-rush	10	1.0
Elymus trachycaulus 'San Luis'	Slender Wheatgrass-San Luis	5	1.0
Glyceria striata	Fowl Mannagrass-VNS	10	3.0

Juncus balticus	Baltic rush	10	0.1
Juncus torreyi	Torrey's rush	2	0.1
Panicum virgatum 'Blackwell'	Switchgrass-Blackwell	5	1.0
Pascopyrum smithii 'Arriba'	Western Wheatgrass-Arriba	10	5.0
Puccinellia nuttalliana	Alkali grass	5	0.1
Schoenoplectus pungens	Three-square bulrush	10	1.0
Spartina pectinata	Prairie Cordgrass-VNS	10	4.0
Sporobolus airoides 'Salado'	Alkali Sacaton-Salado	5	0.4
Verbena hastata	Blue verbena (swamp vervain)	3	0.1
		100	**18.3**

*Pure Live Seed (PLS) rate for drill seeding. If broadcast seeding, double the rate shown.

Water Quality Seed Mix:

Scientific Name	**Common Name, Variety**	**PLS lbs/Acre***
Cleome serrulata	Rocky Mountain beeplant	4.00
Distichlis spicata	Inland saltgrass, native	1.00
Elymus canadensis	Canada wildrye, Mandan	3.50
Elymus trachycaulus	Slender wheatgrass, San Luis	3.00
Galliardia aristata	Blanket flower	2.00
Helianthus annuus	Annual sunflower, native	0.50
Heliomeris multiflora	Showy goldeneye	0.25
Juncus arcticus	Baltic rush, native	0.04
Nassella viridula	Green needlegrass, Lodom	2.50
Panicum virgatum	Switchgrass, Blackwell	1.00
Pascopyrum smithii	Western wheatgrass, Arriba	6.00
Spartina pectinata	Prairie Cordgrass, native	2.50
Sporobolus airoides	Alkali sacaton, native	0.35
Verbena hastata	Blue vervain, native	0.10
Total		**26.74**

*Pure Live Seed (PLS) rate for drill seeding. If broadcast seeding, double the rate shown.

Delete the following from Section 900.02.A

"All slopes 2:1 and flatter shall be seeded by mechanical power drawn drills followed by packer wheels or drag chains. Mechanical power drawn drills shall have depth bands set to maintain a planting depth of at least one quarter inch and shall be set to space the rows not more than seven inches (7") apart. Seed that is extremely small shall be sown from a separate hopper adjusted to the proper rate of application."

Add the following to Section 900.02.A:

Seeding shall not be undertaken until adjacent site improvements and pavements are substantially complete. No trucking or moving of equipment or materials will be permitted upon completed seeded areas.

Seed shall be drilled mechanically with a mechanical, power-drawn drill followed by packer wheels. Seed shall be applied at the specified rate. Seeding will not be permitted when wind velocity is such as to prevent uniform seed distribution. No application shall be undertaken during inclement or the forecast of inclement weather. No application shall take place in the presence of free surface water or when the ground is frozen or un-tilled. Seed depth shall be 1/16"-1/4" and rows shall be spaced not more than 7" apart. Contractor shall drill half of the required PLS per acre in on direction, and then drill the remaining half of the required PLS per acre in a direction 90 degrees to the first half.

If seeding, raking in, and rolling operations are not performed in one (1) mechanical operation, the raking and rolling operations shall be performed separately and immediately after seeding operations.

Slopes 4:1 or greater and hand-seeded areas: Double seeding rates.

Some portions of project areas may be inaccessible to a drill. In these areas, which shall be agreed upon by contractor and engineer, seed shall be uniformly broadcast at twice the specified PLS per acre and covered with soil to a depth of one-quarter (1/4) inch to one-half (1/2) inch by hand raking or harrowing by some other means acceptable to engineer.

Broadcast seeding shall be accomplished using hand-operated "cyclone-type" seeders or rotary broadcast equipment attached to construction or revegetation machinery. All machinery shall be equipped with metering devices. Broadcasting by hand shall be acceptable on small, isolated sites. Prior to hand broadcast seeding, divide the seed required into two portions. Apply the first half of the seed and then follow up by applying the second portion to ensure complete coverage by seed. When broadcast seeding, passes shall be made over each site to be seeded in a manner to ensure an even distribution of seed. When using hopper type equipment, seed shall be frequently mixed within the hopper to discourage seed settling and uneven planting distribution of species.

Broadcast seeding shall take place immediately following the completion of final seedbed preparation techniques and upon inspection and approval of engineer. Broadcast seeding should not be conducted when wind velocities would prohibit even seed distribution.

Do not seed areas in excess of that which can be mulched on same day.

Do not sow immediately following rain, when ground is too dry, frozen or during windy periods.

Roll seeded area with roller not exceeding 100 lbs.

Apply mulch immediately following seeding and rolling.

Delete Section 900.02.B in its entirety and replace with the following:

B. Soil Preparation

All areas to receive seed shall be prepared as described in this section.

A. Deliver, Storage, and Handling

Take adequate measures to control offensive odors caused by delivery, stockpiling and spreading of soil amendments.

a. Materials shall be stored as recommended by the manufacturer.

b. Avoid stockpiling soil amendments for more than seven consecutive days prior to spreading.

B. Submittals:

a. Product data and test results showing mixture composition and analysis for all materials

b. Delivery tickets on materials to verify quantities

a. Soil Amendment

i. The final soil amendment for seeded areas will be based on soil testing and resultant recommendations described below. For the purposes of bidding, contractor shall assume that the soil amendment for seeded areas will include the following:

1. Humate Soil Conditioner

a. Humate soil conditioner topically applied to the soil at a rate of 2,000 pounds per acre. The soil conditioner shall contain and biochar, humates, and mycorrhizae.

2. Class 1 Compost

a. The organic material shall have an acidity in the range of pH 5.5 to 8.5, shall not exceed 3 mmhos/cm. salt content, shall not contain harmful levels of fecal coliform, salmonella, metals, or other materials of health concern, shall have AmmoniaN/NitrateN and carbon/nitrogen ratios that indicate maturity and stability of the compost, and shall have a minimum of 25% organic content. Sand, gypsum or peat moss are unacceptable materials. The mixture shall be free from clay subsoil, stones, lumps, plants and their roots, sticks, weed stolons and seeds, high salt content and other materials harmful to plant life. Apply at a rate of 2 CY/1,000 SF.

3. Organic Fertilizer

a. Biosol Forte organic granular fertilizer, N-P-K Analysis: (7-2-1). Application Rate: Twenty (20) pounds of material per 1,000 square feet.

b. Soil Testing

i. The Contractor shall collect composite soil samples from representative locations throughout the site at completion of rough grading. If there are notable differences in soil appearance, separate samples shall be collected from each observed soil type. Coordinate with Owner's Representative for soil collection locations.

ii. The Contractor shall submit composite soil samples to an approved soil testing laboratory for nutrient and texture analysis.

iii. The Contractor shall notify the Owner's Representative seventy-two (72) hours in advance of the dates, times, and locations when/where composite soil samples will be collected.

iv. Laboratory results shall be submitted to the Owner's Representative within seventy-two (72) hours of receipt.

c. Bed Preparation for Seeded Areas

i. Loosen subgrade to a minimum depth of 12" with a deep harrow. Ripping and tilling shall be done in a direction that generally follows the natural contour of the site. Remove stones over 2" and sticks, roots, rubbish and all other extraneous materials.

ii. Provide soil amendment, temporary fencing, and all other accessories and materials necessary to assure complete and healthy growth of seeded areas.

iii. Spread compost and till or disk in thoroughly to a depth of 6", and bring to minimum depth required to meet lines, grades and elevations shown. Tilling or disking shall be done first in one direction and cross-tilled or disked in the perpendicular direction.

iv. Grade seeded areas to smooth, even surface with loose, uniformly fine texture. Roll, rake, drag lawn areas and remove ridges and fill depressions as required to meet finish grades. Finish grades to 1" below the top of adjacent pavement.

v. The prepared subgrade shall have no lumps or stones over two (2) inches. No seeding shall be installed on any area which has not been so prepared. Obtain the Owner's Representative written acceptance of prepared areas prior to proceeding.

vi. Top dress prepared soil with humate and fertilizer at rate specified in paragraph 900.02.B.a of this section.

vii. Notify the Engineer for review and acceptance of fine grading prior to seeding

Any areas that have been prepared and approved for seeding and because of weather or other causes are not immediately seeded are subject to re-inspection and acceptance by the Engineer. The Contractor shall notify the Engineer of his intent to seed following delays, allowing the Engineer sufficient time to inspect and approve the prepared areas. Any areas that in the opinion of the Engineer require re-grading or additional soil preparation because of wind and water erosion, or require additional tillage because of compaction, shall be done at the Contractor's expense.

viii. Seed Bed Guarantee:

a. Upon completion of soil preparation work, the Contractor shall guaranty that no rock, concrete, construction materials or other

rubble lie within the top six inches of the surface of the prepared areas.

b. Contractor shall also guaranty against settlement for one full year after initial acceptance. Any corrections required to meet this specification, including repair/replacement of seed shall be at the Contractor's expense.

d. Maintenance and Acceptance

Maintenance period: Shall begin immediately after site preparation of each area and shall continue until Final Acceptance.

Maintenance Requirements until Final Acceptance:

i. Weed Control: Apply appropriate herbicide(s) in accordance with manufacturers suggested rate(s) to control weeds. Herbicide application must comply with all requirements of herbicide/pesticide applicators license, including suitable warning/signing following application.

ii. Disease and Insect Control: Apply fungicides and insecticides as required to control diseases and insects by a licensed applicator in accordance with state law requirements.

iii. Watering: The Contractor shall be responsible for watering of seeded areas if he deems it necessary to insure performance under this Section. Apply only the amount of water necessary to maintain seeded areas in a healthy condition until the work has been accepted. Reduce amount of water after seed is established. Avoid standing water, surface wash, or erosion from over-watering.

iv. Protection: Provide sufficient barriers and signage notifying the public to keep off newly seeded areas.

v. Repair: Re-seed or plant areas that have washed out or are eroded or otherwise do not have adequate coverage of vegetation.

vi. Inspection: The Contractor shall notify the Engineer prior to watering, mowing, fertilizing, and spraying operations.

vii. Maintenance by Owner: After notice of Final Acceptance is given by the Engineer, further maintenance shall be provided by the Owner. Contractor shall submit written notice to the Engineer if maintenance is not being performed adequately to industry standards.

Conditional Re-vegetation Acceptance: Upon completion of all seeding operations, the Contractor shall notify the Engineer to review the work. If all work is acceptable, the Engineer shall record that date and issue a "Substantial Completion" certificate.

Final Re-vegetation Acceptance: Seeded areas shall receive final acceptance provided all requirements, including maintenance, have been complied with, and a healthy, viable stand of grass is established, free of weeds, undesirable grass species, disease and insects. Seeded areas shall meet the required coverage as stated below.

Areas seeded in the spring shall be inspected for required coverage the following fall not later than October 1st. Areas seeded in the summer or fall shall be inspected for required coverage the following spring not later than May 15th. Required coverage for seed areas shall be 60% aerial cover as measured from 5' directly overhead, with no bare spots. Determination of required coverage will be based on a random sampling of the entire project area. The following Spring prior to May 15th the seed areas shall be re-inspected for the required coverage. At this time 80% foliage cover as measured from 5' directly overhead shall be required. The same random sampling method will be used to determine coverage. When acceptable coverage has been met the Engineer shall issue a "Final Acceptance of Seeding Work" which shall end the seed establishment period and shall relieve the Contractor from future obligation for seeding work.

Guarantee:

a. Upon completion of soil preparation work, the Contractor shall guaranty that no rock, concrete, construction materials or other rubble lie within the prepared areas.
b. Contractor shall also guaranty against settlement for one full year after initial acceptance. Any corrections required to meet this specification, including repair/replacement of seed shall be at the Contractor's expense.

Delete Section 900.02.C and replace with the following:

All seeded areas on the project not designated to receive erosion control blanket shall be mulched with hydraulic mulch and tackifier. The hydraulic mulch and tackifier shall materials and installation shall meet the requirements of the 2019 CDOT Standard Specification Section 213.

Subsection 900.03 is revised as follows:

Add the following to Section 900.03:

Erosion control fabric shall be KoirMat 700 coconut fiber erosion control mating (woven matting of coir yarn) manufactured by Nedia Enterprises, Inc. or approved equivalent.

2"x4"x12" long wood stakes shall be used in place of staples as shown in the City Standard ECB detail. Roll matting onto slopes without stretching or pulling.

Lay matting smoothly on surface in direction of water flow. Bury top end of each section in 6 inch deep excavated topsoil trench. Provide six (6) inch overlap of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil.

Lightly dress slopes with topsoil to ensure close contact between fabric and soil.

- END OF SECTION -

ADDITION OF SECTION 902 – PLANTING

Section 902 is hereby added to the Standard Specifications and shall include the following:

902.01 Description

Furnish all plant backfill material, trees, shrubs, grasses, fertilizer, mulch, labor, equipment, and non-plant materials required to complete installation of planting as indicated on the drawings.

A. Quality Assurance

1. Inspection:
    a. Plant materials shall be inspected by Engineer at the growing site and tagged or otherwise approved for delivery.
    b. Inspection at growing site does not preclude right of rejection at construction site.

B. Plant Qualification and Protection:

1. Plants shall have a habit of growth that is normal for the species and shall be of sound health, vigorous growth, and free from insect pests, diseases, and injuries. All plants shall equal or exceed the measurements specified in the plant lists, which are minimum acceptable sizes. They shall be measured and approved by the Engineer on site before pruning, with branches in normal position. Any necessary pruning shall be done at the time of planting. Requirements for the measurement, branching, grading, quality, balling, and burlapping of plants shall equal or exceed the code of standards currently recommended by the American Association of Nurserymen. Collected stock will not be permitted.
2. Substitutions will not be permitted without the written approval of Engineer.
3. Contractor shall submit written verification of plant stock origin to assure northern hardiness of all plant material prior to planting.
4. Protection after delivery: The balls of burlapped plants, which cannot be planted immediately on delivery, shall be covered with moist soil or mulch. All plants shall be watered as necessary until planted.

C. Submittals

1. Submit samples of nylon strap and wire to be used for tree guying for approval by the Engineer prior to planting.

2. Submit plant list, listing source of material, including origin of plants not grown in Colorado.

3. Submit credentials of licensed pesticide applicator at least one-week prior to application of pesticides on-site.

4. Submit fertilizer composition analysis 10 days before delivery to the site.

D. Planting Conditions

1. Planting operations shall be conducted under favorable weather conditions, approved by the Engineer.

2. Plants shall be installed only when soil and weather conditions permit and in accordance with locally accepted practices, and as approved by the Engineer.

3. If the Contractor has not received final approval for all work under the contract by October 15, they shall be responsible for wrapping all deciduous trees using materials by methods outlined in this section.

4. Installation of plant materials shall not be permitted until adjacent site improvements and pavements are substantially complete.

E. Damage to Other Improvements

All costs for repair or replacement of any damage to other work done on-site or on adjacent properties by installation of plant material shall be borne by Contractor installing plant material.

902.02 Materials

A. Prepared Plant Backfill

Prepared plant backfill shall consist of excavated existing site soil and soil amendment in the following proportions: 1/3 soil amendment, 2/3 existing site soil.

B. Soil Amendment

Acceptable organics are: Class 1 compost. The organic material shall have an acidity in the range of pH 5.5 to 8.5, shall not exceed 3 mmhos/cm. salt content, shall not contain harmful levels of fecal coliform, salmonella, metals, or other materials of health concern, shall have AmmoniaN/NitrateN and carbon/nitrogen ratios that indicate maturity and stability of the compost, and shall have a minimum of 25% organic content. Sand, gypsum or peat moss are unacceptable materials. The mixture shall be free from clay subsoil, stones, lumps, plants and their roots, sticks, weed stolons and seeds, high salt content and other materials harmful to plant life.

C. Water

Furnishing and distribution of the water for all portions of this section shall be the responsibility of the Contractor.

D. Staking, Guying and Wrapping

1. Wire supports shall be metal wire, sixteen (16) gauge.

2. Grommeted nylon straps, 1 ½" wide.

3. Staking pole support shall be 2" round wooden post, six (6) feet long.

4. Tree wrapping material shall be first quality 4" wide, bituminous impregnated tape, corrugated or crepe paper, brown in color, specifically manufactured for tree wrapping and having qualities to resist insect infestation.

5. Guy wire signals shall be ½" diameter white PVC, length as shown on the Drawings.

E. Mulching

Wood mulch: shall be shredded natural colored mulch. Submit sample to Owner for approval.

F. Fertilizer

Trees and shrubs: Osmocote Sierrablen, nine (9) month slow release

902.03 Execution

A. Acceptance

Obtain the acceptance of the Engineer of all plant materials and staked plant locations prior to beginning planting operations.

B. Tree and Shrub Planting Site Preparation

1. Dig pits and prepare planting soil prior to moving plants to their respective locations for planting to ensure that they will not be unnecessarily exposed to drying elements or to physical damage. Circular pits with vertical sides hard-trimmed shall be excavated for all plants. Diameter of pits for planting shall be at least twice the spread of balls or container, or as detailed on the drawings.

2. It is not anticipated that planting shall be done where the depth of soil over underground construction obstructions, or rock, is insufficient to accommodate the roots or where pockets in rock or impervious soil will require drainage. If such conditions are encountered in excavation of planting areas, and if the stone, boulders, or other obstructions cannot be broken and removed by hand methods in the course of digging plant pits of the usual size, other locations for the planting may be designated. Removal of rock or other underground obstructions and relocation of plant materials shall be done only as directed by the Engineer. If changes in the location of the work or if the removal of rock or other obstructions, other than existing underground utilities, involved additional work, the Contractor shall notify the Engineer for approval of extra payment.

3. In some locations, trees and shrubs will be planted in areas with riprap. In these locations, the riprap shall be removed from the planting pit. After placing the planting in the pit, the removed riprap will be reset into the plant pit around the root ball and mixed with planting backfill. The intent is to have riprap securely installed up to the root ball of the plant

4. Contractor shall dispose of excess excavated planting pit material at an approved off-site location or as directed by the Engineer.

5. Apply superphosphate to backfill mix according to manufacturer's instructions.

C. Setting Trees and Shrubs

1. All plants other than native cottonwood (Populus deltoides)

Unless otherwise specified, all plants shall be planted in pits to such a depth that the finished grade level at the plant after settlement will be the same as that at which the plant was grown. They shall be planted upright and faced to give the best appearance or relationship to adjacent areas. No burlap shall be pulled out from under balls. Remove all wire and surplus binding from tree ball with adequate wire cutters after tree is placed and stabilized in plant pit. When the hole is 1/2 filled, the soil mix shall be puddled with

water to eliminate air pockets as necessary and allow it to soak away. After the ground settles additional soil shall be filled into the level of the finished grade. Remove plants from container and spread out roots carefully and place in hole. Water plant thoroughly on day of planting.

D. Guying, Staking and Wrapping

Trees shall be supported immediately after planting. All trees shall be guyed and wrapped as detailed. Wire shall be passed through grommets in nylon straps to prevent direct contact with bark of the tree and placed around the trunk in a single loop. Wire shall be tightened and kept taut by twisting the strands together.

E. Mulch

Mulch shall be placed evenly around all plants as noted on the drawings to a 3" depth. Pull mulch away from the base of the plant.

F. Maintenance Acceptance and Warranty

1. A final walk-through shall be performed at the completion of all planting operations under this contract.

2. At the time of final walk-through, the landscape contractor shall have the planting areas free of debris. Plant basins shall be in good repair, debris and litter shall be cleaned up, and walkways, curbs, and roads shall be cleared of soil and debris. The inspection shall not occur until these conditions are met.

3. Engineer will review the work and identify a list of deficiencies in the form of a punch-list.

4. Engineer will five written notice of final acceptance when the work has been performed in compliance with the contract documents.

5. Correct deficiencies withing the first ten (10) days of the final walk-through. Correct work in accordance with the contract documents at no cost to the owner.

6. Final acceptance shall not be given until all deficiencies are corrected. The landscape contractor shall maintain the site and all plantings until final acceptance.

7. Vandalism: The Contractor shall note that the project is in an open space area and that vandalism may occur. The Contractor shall take reasonable measures to protect plantings from vandalism until final acceptance and shall repair damaged work caused by vandalism.

- END OF SECTION -

SECTION 910 - EROSION AND SEDIMENT CONTROL

Section 910 is hereby added to the Standard Specifications and shall include the following:

910.1 GENERAL

910.1.1 Scope of Work:

A. This work shall consist of temporary measures needed to control erosion and water pollution. These temporary measures shall include, but not be limited to, berms, dikes, coffer dams, sediment basins, fiber mats, waddles, netting, gravel, mulches, grasses, slope drains, stockpile protection, and other erosion control devices or methods. These temporary measures shall be installed at the locations where needed to control erosion and water pollution during the construction of the project, and during the maintenance period for the Sand Creek Stockpile, consistent with the ***City*** Stormwater Criteria Manual (SCM) requirements, and as directed by the ***Engineer***, and as shown on the Drawings.

B. The Erosion Control Plan presented in the Drawings serves as a concept plan and base sheets for erosion and sediment control during construction. ***Contractor*** has the ultimate responsibility for providing adequate sediment and erosion control and water quality throughout the duration of the project and the maintenance period for the Sand Creek Stockpile. Therefore, the ***Contractor*** shall develop a plan, consistent with the ***City*** SCM requirements, and provide whatever measures are needed to achieve the required protection of areas that will be disturbed during the contractors work on the project consistent with the Contractors work plan for the project. ***Contractor*** shall include in his bid price for erosion and sediment control all items that may be needed to control erosion, sediment and water pollution.

910.1.2 Submittals: The erosion and sediment control facilities shown on the Drawings are conceptual, and the ***Contractor*** shall update the drawings prior to the start of work and develop a detailed Storm Water Management Plan (SWMP), consistent with the ***Contractor's* plan to accomplish the work,** a continuously updated copy of which shall be retained on the site. The ***Contractor*** shall submit an application to the ***State***, and submit the SWMP to the ***State*** at their request. The ***Contractor*** shall obtain a Storm Water Construction Permit from the State. The ***Contractor*** shall also apply for a ***City*** Grading and Erosion Control (GEC) Permit and create and submit a ***City*** Construction and Stormwater Management Plan (referred to as the C-SWMP by the ***City***). The C-SWMP shall indicate that it has been prepared for the ***City*** and the ***State***. ***Permits/approvals for both the City and the State must be obtained prior to construction.*** The ***Contractor*** is responsible for implementing the C-SWMP and compliance with the conditions of the Storm Water Construction Permit and GEC permit. The ***State*** or the ***Engineer*** may direct the ***Contractor*** to modify the C-SWMP during construction as conditions warrant. The ***Contractor*** shall note changes on the C-SWMP immediately as it must reflect current site conditions.

910.1.3 Materials:

A. Materials may include hay bales, straw, fiber mats, fiber netting, wood cellulose, fiber fabric, manufactured waddles, gravel, riprap, pre-cast concrete barriers, and other suitable materials, and shall be reasonably clean, free of deleterious materials, and certified weed free. All materials shall be submitted to the ***Engineer*** for approval prior to installation.

B. Temporary grass cover (if required) shall be a quick growing species suitable to the area, which will provide temporary cover and will not later compete with the grasses sown for permanent cover. All grass seed shall be approved by the ***Owner*** prior to installation.

C. Fertilizer and soil conditioners shall be approved by the ***Owner*** prior to installation.

D. Miscellaneous: All other material used by the Contractor for water diversion and erosion control shall be specified on a detailed working Erosion and Sediment Control Plan to be completed by the Contractor and reviewed by the ***Engineer*** prior to starting work.

910.1.4 Construction Requirements: All materials for erosion and sediment control shall be installed in accordance with these Specifications. To the extent possible, movement of construction equipment within the flowing portions of waterways should be minimized. The Contractor shall divert flows so construction equipment, materials, and earthwork are not exposed to flow to the extent practical.

The erosion and sediment control facilities shall be installed prior to construction and shall remain in place throughout. The Contractor will be required to clean sediment from upstream sediment traps and provide other maintenance as required to the erosion and sediment control facilities during construction.

910.2 PERMITS AND COMPLIANCE

A. ***Contractor*** must apply for and obtain a Construction Dewatering Permit (Colorado Wastewater Discharge Permit), a Stormwater Construction Permit from the Colorado Department of Health and shall obtain approval of an Erosion and Stormwater Quality Control Plan from the City of Colorado Springs. All costs for these permits shall be the responsibility of ***Contractor***. These permits require that specific actions be performed at designated times. ***Contractor*** is legally obligated to comply with all terms and conditions of the permits including testing for effluent limitations if required by the terms of the permits.

CONTRACTOR shall allow the Colorado Department of Health or other representatives to enter the site to test for compliance with the permit. Non-compliance with the permit can result in stoppage of all work.

In addition to permit requirements, ***Engineer*** shall also monitor ***Contractor's*** erosion control and work methods. If the overall function and intent of erosion control is not being met, then ***Engineer*** shall require ***Contractor*** to provide additional measures as required to obtain the desired results. Costs for any additional erosion control measures shall be the responsibility of ***Contractor***, since he has the ultimate responsibility for providing adequate erosion control and water quality for the duration of the project.

910.3 STABILIZATION OF DISTURBED AREAS

A. Temporary sediment control measures shall be established within 5 days from time of exposure/disturbance. Permanent erosion protection measures shall be established within 21 days after final grading of areas.

910.4 PROTECTION OF ADJACENT PROPERTIES

A. Properties adjacent to the site of a land disturbance shall be protected from sediment deposition. In addition to the erosion control measures required on the Drawings, perimeter controls may be required if damage to adjacent properties is likely. Perimeter controls include, but are not limited to, a vegetated buffer strip around the lower perimeter of the land disturbance, sediment barriers such as straw bales and silt fences; sediment basins; or a combination of such measures. Vegetated buffer strips may be used only where runoff in sheet flow is expected and should be at least 20 feet in width.

910.5 TIMING AND STABILIZATION OF SEDMENT AND EROSION CONTROL MEASURES

A. Sediment barriers, perimeter dikes, and other measures intended to either trap sediment or prevent runoff from flowing over disturbed areas must be constructed as a first step in grading and be made functional before land disturbance takes place. Earthen structures

such as dams, dikes, and diversions must be stabilized within 5 days of installation. Stormwater outlets must also be stabilized prior to any upstream land disturbing activities.

910.6 WORKING IN OR CROSSING WATERCOURSES

A. Construction vehicles should be kept out of watercourses to the extent possible. Where in-channel work is necessary, precautions must be taken to stabilize the work area during construction to minimize erosion. The channel (including bed and banks) must always be re-stabilized immediately after in-channel work is completed.

B. When work must occur in a live (wet) watercourse, extra care must be exercised by the Contractor to avoid contamination of the water from petroleum products and other pollutants and to minimize the movement of sediment downstream.

910.7 CONSTRUCTION ACCESS ROUTES

A. Wherever construction vehicles enter or leave a construction site, a Stabilized Construction Entrance is required. Where sediment is transported onto a public road or parking lot surface, the pavement shall be cleaned thoroughly at the end of each day. Sediment shall be removed from roads or parking lots by shoveling or sweeping and be transported to a sediment-controlled disposal area. Street washing shall be allowed only after sediment is removed in this manner.

910.8 DISPOSITION OF TEMPORARY MEASURES

A. All temporary erosion and sediment control measures shall be disposed of within 30 days after final site stabilization is achieved or after the temporary measures are no longer needed as determined by ***Engineer***. Trapped sediment and other disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion.

910.9 MAINTENANCE

A. All temporary and permanent erosion and sediment control practices must be maintained and repaired as needed to assure continued performance of their intended function.

- END OF SECTION -

SECTION 920 - WATER CONTROL AND DEWATERING

Section 920 is hereby added to the Standard Specifications and shall include the following:

920.1 General

920.1.01 Scope of Work:

The work of this section consists of controlling groundwater, channel low flows, and higher storm flows during construction. Contractor is cautioned that the work involves construction in and around drainage channels, local rivers, and areas of local drainage. These areas are subject to frequent periodic inundation.

920.1.02 Materials:

Onsite materials may be used within the limits of construction to construct temporary dams and berms. Other materials such as plastic sheeting, sandbags, pre-cast concrete barriers, riprap and storm sewer pipe, and pumps may also be used if desired by the ***Contractor***.

920.1.03 Submittals

The ***Contractor*** is required to submit a detailed Water Control and Dewatering Plan for review prior to installing any components of the plan. At a minimum, the Water Control and Dewatering Plan shall include:

A. Descriptions of proposed groundwater and surface water control facilities including but not limited to, equipment, methods, standby equipment and power supply, means of measuring inflow to excavations, pollution control facilities, discharge locations to be utilized, and types of construction, such as: temporary well points, coffer dams, channels, or other flow diversion schemes.

B. Drawings showing locations, dimensions, and relationship of elements of each system.

C. Design calculations demonstrating adequacy of proposed dewatering systems and components.

D. If system is modified during installation or operation, revise or amend and resubmit Water Control and Dewatering Plan.

920.1.04 Construction Requirements:

A. ***General:*** For all excavation, the ***Contractor*** shall provide suitable equipment and labor to remove water, snow and ice and keep the excavation dewatered so that construction can be completed in dry conditions where required by the Drawings and Specifications. Continuously control water during course of construction, including weekends and holidays and during periods of work stoppages, and provide adequate backup systems to maintain control of water.

Water control shall be accomplished such that no damage is done to adjacent channel banks or structures. The ***Contractor*** is responsible for investigating and becoming familiar with all site conditions that may affect the work including surface water; level of groundwater and the time of year the work is to be done. All excavations made as part of dewatering operations shall be backfilled with the same type material as was removed and compacted to a minimum of 95% of the maximum dry density modified proctor (ASTM 1557) except where replacement by other materials and/or methods are required.

By submitting a BID, CONTRACTOR acknowledges that CONTRACTOR has investigated the risk arising from surface water and groundwater, and has prepared his BID accordingly, and assumes all of said risk.

At no time during construction shall CONTRACTOR affect existing surface or subsurface drainage patterns on adjacent property. Any damage to adjacent property resulting from CONTRACTOR's alteration of surface or subsurface drainage patterns shall be repaired by CONTRACTOR at no additional cost to OWNER.

Pumps and generators used for dewatering and water control shall be quiet equipment enclosed in sound deadening devices. Contractor shall remove all temporary water control facilities when they are no longer needed or at the completion of the PROJECT.

B. ***Surface Water Control:*** Surface water control generally falls into the following categories:

1. Normal low flows along Sand Creek
2. Storm/flood flows along Sand Creek
3. Flows from pipe outfalls and
4. Local surface flows

The ***Contractor*** shall coordinate, evaluate, design, construct, and maintain temporary water control systems. These systems shall not worsen flooding, alter major flow paths, or worsen flow characteristics during construction. The ***Contractor*** is responsible to ensure that any such worsening of flooding does not occur.

At a minimum, the ***Contractor*** will be responsible for diverting the quantity of surface flow around the construction area so that the excavation and the placement of embankment, riprap and bedding material can remain free of surface water and ice for the time it takes to install these materials, and the time required for curing of any concrete or grout. The ***Contractor*** is cautioned that the minimum quantity of water to be diverted is for erosion control and construction purposes and not for general protection of the construction site. ***It shall be the Contractor's responsibility to determine the quantity of water which shall be diverted to protect all work from damage caused by stormwater. The Contractor will be responsible for all repairs required due to flood damage***.

The Contractor shall, at all times, maintain a flow path for Barnes Tributary inflow and Sand Creek Channel flow. Temporary structures such as berms, sandbags, pre-cast concrete barriers, etc. may be permitted for the control of channel flow, as long as such measures are not a major obstruction to flood flows, do not worsen flooding, or alter historic flow routes. Existing trees and vegetation should be preserved. The Contractor shall conduct the operation in such a manner that storm waters may proceed uninterrupted along the drainage courses. Any damage done during storm flows to temporary or partially completed structures, or resulting from the Contractor's operations, shall be repaired by the Contractor at the Contractor's expense.

C. ***Groundwater Control:*** The Contractor shall install adequate measures to maintain the level of groundwater below the foundation subgrade elevation and maintain sufficient bearing capacity for structures, pipelines, earthwork, and rock work. Groundwater levels may fluctuate. Such measures may include, but are not limited to, installation of perimeter subdrains, pumping from drilled holes or pumping from sumps excavated below the subgrade elevation. The foundation bearing surfaces are to be kept dewatered and stable until the structures or other types of work are complete and backfilled. Disturbance of foundation subgrade by Contractor operations shall not be considered as originally unsuitable foundation subgrade and shall be repaired at Contractor's cost. The Contractor shall coordinate ground water control measures with surface water diversions since the effectiveness of ground water control will depend on the amount of surface water infiltration allowed by the diversion system.

Contractor shall dispose of groundwater as follows:

A. Obtain discharge permit for water disposal from authorities having jurisdiction.

B. Treat water collected by dewatering operations, as required by regulatory agencies, prior to discharge.

C. Discharge water as required by discharge permit and in manner that will not cause erosion or flooding, or otherwise damage existing facilities, completed Work, or adjacent property.

D. Remove solids from treatment facilities and perform other maintenance of treatment facilities as necessary to maintain their efficiency.

- END OF SECTION -

SECTION 925 – CLEARING AND GRUBBING

Section 925 is hereby added to the Standard Specifications and shall include the following:

925.01 Description

This work consists of clearing, grubbing, removing, and disposing of all vegetation, debris, and materials as needed to construct the proposed improvements as shown on the Drawings and as required by the Work. Vegetation and objects designated to remain shall be preserved free from injury or defacement.

925.02 Construction Requirements

All trees, shrubs, grass, weeds and debris located within approximate work limits as shown on the plans and details that must be removed to accomplish the work shall be removed and properly disposed of offsite, unless otherwise specified on the plans or by the owner. Removal of any vegetation shall be reviewed and approved by the Owner prior to removal. Trees and significant shrubs to be removed shall be marked by the contractor and approved by the owner prior to removal. Any object including trees, shrubs, or plants not designated for removal by the ***Owner***, that are damaged shall be repaired or replaced as directed by the ***Owner,*** at the ***Contractor's*** expense.

Except in areas to be excavated, all holes resulting from the removal of obstructions shall be backfilled with suitable material and compacted in accordance with the Standard Specifications.

Except as otherwise noted in the plans and special provisions, all cleared timber shall be moved from the project and shall become the property of the ***Contractor***. Branches on trees or shrubs shall be removed as directed. All trimming shall be done in accordance with good tree surgery practices as recommended by ***City Parks and Recreation Department***.

- END OF SECTION -

SECTION 950 - CONSTRUCTION SURVEYING

Section 950 is hereby added to the Standard Specifications and shall include the following:

950.01 General

A. Surveying: It shall be the responsibility of the ***Contractor*** to provide construction staking for as needed to control horizontal and vertical locations of the proposed work items including all offset lines necessary for construction.

B. All construction surveying provided by the ***Contractor*** shall be completed under the Supervision of a Colorado Registered Land Surveyor.

C. The construction plans for the project provide the elevations and descriptions of permanent and temporary project monuments. The Contractor shall check all control points provided by the Engineer and verify and document their accuracy, prior to using them for construction surveying.

D. Supervision: The Contractor shall have supervision, knowledge of the project requirements and proper installation, and construction procedures, available in the field at all times that work is progressing.

- END OF SECTION -

SCHEDULE F – CONSTRUCTION PLANS

SEE IFB NOTICE IN BIDNET FOR PLANS

SCHEDULE G – BARNES STORMWATER MANGEMENT PLAN (CSWMP)

SEE IFB NOTICE IN BIDNET

SCHEDULE H – BARNES DRAINAGE REPORT

SEE IFB NOTICE IN BIDNET

SCHEDULE I – GRADING & EROSION CONTROL

SEE IFB NOTICE IN BIDNET

SCHEDULE J – STOCKPILE STORMWATER MANAGEMENT PLAN

SEE IFB NOTICE IN BIDNET

SCHEDULE K – STOCKPILE GRADING & EROSION CONTROL

SEE IFB NOTICE IN BIDNET

SCHEDULE L – VARIANCE LETTER

SEE IFB NOTICE IN BIDNET

SCHEDULE M -- MINIMUM INSURANCE REQUIREMENTS

The following listed minimum insurance requirements shall be carried by all contractors and consultants unless otherwise specified in the City's solicitation package, Special Provisions or Standard Specifications.

☒	Commercial General Liability for limits not less than $1,000,000 combined single limit with $2,000,000 aggregate for bodily injury and property damage for each occurrence. Coverage shall include blanket contractual, broad form property damage, products and completed operations
☒	Workers' Compensation and Employers Liability as required by statute. Employers Liability coverage is to be carried for a minimum limit of $1,000,000.
☒	Automobile Liability covering any auto (including owned, hired, and non-owned autos) with a minimum of $1,000,000 each accident combined single limit.
☒	Pollution Legal Liability Insurance shall apply to sudden and gradual pollution conditions resulting from the escape of release of smoke, vapors, fumes, acids, alkalis, toxic chemicals, liquids, or gases, natural gas, waste materials, or other irritants, contaminants, or pollutants (including asbestos). If the coverage is written on a claims-made basis, the Contractor warrants that any retroactive date applicable to coverage under the policy precedes the effective date of this Contract; and that continuous coverage will be maintained or an extended discovery period will be exercised for a period of three (3) years beginning from the time that work under this contract is completed. Policy limits shall be no less than $1,000,000 per loss with $2,000,000 aggregate coverage.

Except for workers' compensation and employer's liability insurance (if applicable), the **City of Colorado Springs must be named as an additional insured**. Certificates of Insurance must be submitted before commencing the work and provide 30 days' notice prior to any cancellation, non-renewal, or material changes to policies required under the contract.

All coverage furnished by contractor is primary, and any insurance held by the City of Colorado Springs is excess and non-contributory.

The undersigned certifies and agrees to carry and maintain the insurance requirements indicated above throughout the contract Period of Performance.

_____

(Name of Company)

_____

(Signature) *Date)*

SCHEDULE N – EXHIBITS

Exhibit 1 Sample Contract
Exhibit 2 Qualification Statement
Exhibit 3 Bid Certification and Representations and Certifications
Exhibit 4 Bid Bond

EXHIBIT 1 – SAMPLE CONTRACT

CONSTRUCTION CONTRACT

Contract Number:		Project Name/Title	
Vendor/Contractor			
Contact Name:		Telephone:	
Email Address:			
Address:			
Federal Tax ID #		Please check one:	☐ Corporation ☐ Individual ☐ Partnership
City Contracting Specialist		City Dept Rep	
NOT TO EXCEED Contract Amount:		City Account #	
Contract Type:	Fixed Unit Price	Period of Performance:	180 DAYS FROM NOTICE TO PROCEED

1. INTRODUCTION

THIS *Fixed Unit Price* CONTRACT ("Contract") is made and entered into this XXX day of XXX, 2024 by and between the City of Colorado Springs, a Colorado municipal corporation and home rule city, in the County of El Paso, State of Colorado, (the "City"), and _____ (the "Contractor").

THE CITY AND THE CONTRACTOR HEREBY AGREE AS FOLLOWS:

The City has heretofore prepared the necessary Contract Documents for the following Activity: XXXX.

The Contractor did on the XXX day of XXX, 2024 submit to the City the Contractor's written offer and proposal to do the work therein described under the terms and conditions therein set forth and furnish all materials, supplies, labor, services, transportation, tools, equipment, and parts for said work in strict conformity with the accompanying Contract Documents, which are attached hereto and incorporated herein by this reference, including the following:

1. This Contract
2. Schedule A – Contractor's Bid
3. Schedule B – General Construction Terms and Conditions
4. Schedule C – Statement of Work
5. Schedule D – Special Provisions
6. Schedule E – Technical Specifications
7. Schedule F – Construction Plans
8. Schedule G – Stormwater Management Plan
9. Schedule H – Drainage Report
10. Schedule I – Grading & Erosion Control
11. Schedule J – Stockpile Stormwater Management Plan

12. Schedule K – Stockpile Grading & Erosion Control
13. Schedule L – Variance Letter
14. Schedule M – Minimum Insurance Requirements

2. COMPENSATION/CONSIDERATION

THIS FIXED UNIT PRICE CONTRACT is established at the Not to Exceed amount of $xxxxxxxx.

Subject to the terms and conditions of the Contract Documents, Contractor agrees to furnish all materials and to perform all work as set forth in its proposal and as required by the Contract Documents.

All pricing is in accordance with the fixed unit prices found in Schedule A, as proposed by the Contractor. Payment made for actual quantities as set forth in Schedule B, General Construction Terms and Conditions. At no time shall the total obligation of the City exceed the not to exceed amount of this Contract.

3. TERM OF CONTRACT

Contractor will start work promptly after the Notice to Proceed and continue to work diligently until completed. The Contractor shall complete all work on an as ordered basis throughout the Contract period which is **180 days from date of Notice to Proceed** ("Period of Performance") as per the specifications and drawings. The Contractor shall provide a two-year guarantee on all work performed under this Contract after the job has been completed and accepted.

4. INSURANCE

The Contractor shall provide and maintain acceptable Insurance Policy(s) consistent with the Minimum Insurance Requirements attached as Schedule I, which includes Property, Liability, and as otherwise listed in Schedule I. The City of Colorado Springs shall be reflected as an additional insured on the Property and Liability policy(s).

Further, Contractor understands and agrees that Contractor shall have no right of coverage under any existing or future City comprehensive, self, or personal injury policies. Contractor shall provide insurance coverage for and on behalf of Contract that will sufficiently protect Contractor, or Contractor's agents, employees, servants or other personnel, in connection with the services which are to be provided by Contractor pursuant to this Contract, including protection from claims for bodily injury, death, property damage, and lost income. Contractor shall provide worker's compensation insurance coverage for Contractor and all Contractor personnel. Contractor shall file applicable insurance certificates with the City and shall also provide additional insurance as indicated in this Contract. ***A CURRENT CERTIFICATE OF INSURANCE IS REQUIRED PRIOR TO COMMENCEMENT OF SERVICES LISTING THE CITY AS ADDITIONALLY INSURED.***

5. RESPONSIBILITY OF THE CONTRACTOR

A. The Contractor shall be responsible for the professional quality, technical accuracy, and the coordination of all Scope of Work services furnished by the Contractor under this Contract. The Contractor shall, without additional compensation, correct or revise any errors or deficiencies in services provided under this Contract to the satisfaction of the City.

B. The City's review, approval of, acceptance of, or payment for the services required under this

Contract shall not be construed to operate as a waiver of any rights under this Contract or of any cause of action arising out of the performance of this Contract, and the Contractor shall be and remain liable to the City for any and all damages to the City caused by the Contractor's negligent performance of any of the services furnished under this Contract.

C. The rights and remedies of the City provided for under this Contract are in addition to any other rights and remedies provided by law.

D. If the Contractor is comprised of more than one legal entity, each such entity shall be jointly and severally liable hereunder.

6. WORK OVERSIGHT

A. The extent and character of the work to be done by the Contractor shall be subject to the general approval of the City's delegated Project Manager.

B. If any of the work or services being performed does not conform with Contract requirements, the City may require the Contractor to perform the work or services again in conformity with Contract requirements, at no increase in Contract amount. When defects in work or services cannot be corrected by re-performance, the City may (1) require the Contractor to take necessary action to ensure that future performance conforms to Contract requirements and (2) reduce the Contract price to reflect the reduced value of the work or services performed.

C. If the Contractor fails to promptly perform the defective work or services again or to take the necessary action to ensure future performance is in conformity with Contract requirements, the City may (1) by Contract or otherwise, perform the services and charge to the Contractor any cost incurred by the City that is directly related to the performance of such work or service or (2) terminate the Contract for breach of contract.

7. SUBCONTRACTORS, ASSOCIATES, AND OTHER CONTRACTORS

A. Any subcontractor, outside associates, or other contractors used by the Contractor in connection with Contractor's work under this Contract shall be limited to individuals or firms that are specifically identified by the Contractor in the Contractor's proposal and agreed to by the City. The Contractor shall obtain the City's Project Manager's written consent before making any substitution of these subcontractors, associates, or other contractors.

B. The Contractor shall include a flow down clause in all of its subcontracts, agreements with outside associates, and agreements with other contractors. The flow down clause shall cause all of the terms and conditions of this Contract, including all of the applicable parts of the Contract Documents, to be incorporated into all subcontracts, agreements with outside associates, and agreements with other contractors. The flow down clause shall provide clearly that there is no privity of contract between the City and the Contractor's subcontractors, outside associates, and other contractors.

8. KEY PERSONNEL

The key personnel listed in the proposal and/or below will be the individuals used in the performance of the work. If any of the listed key personnel leave employment or are otherwise not utilized in the performance of the work, approval to substitute must be obtained by the

Contractor from the City's Project Manager. Any substitute shall have the same or a higher standard of qualifications that the key personnel possessed at the time of Contract award.

9. START AND CONTINUANCE OF WORK

It is further agreed that the Contractor will start work promptly and continue to work diligently until this Contract is completed.

10. APPROPRIATION OF FUNDS

This Contract is expressly made subject to the limitations of the Colorado Constitution and Section 7-60 of the Charter of the City of Colorado Springs. Nothing herein shall constitute, nor be deemed to constitute, the creation of a debt or multi-year fiscal obligation or an obligation of future appropriations by the City Council of Colorado Springs, contrary to Article X, § 20, Colo. Const., or any other constitutional, statutory, or charter debt limitation. Notwithstanding any other provision of this Contract, with respect to any financial obligation of the City which may arise under this Agreement in any fiscal year after the year of execution, in the event the budget or other means of appropriation for any such year fails to provide funds in sufficient amounts to discharge such obligation, such failure (i) shall act to terminate this Contract at such time as the then-existing and available appropriations are depleted, and (ii) neither such failure nor termination shall constitute a default or breach of this Contract, including any sub-agreement, attachment, schedule, or exhibit thereto, by the City. As used herein, the term "appropriation" shall mean and include the due adoption of an appropriation ordinance and budget and the approval of a Budget Detail Report (Resource Allocations) which contains an allocation of sufficient funds for the performance of fiscal obligations arising under this Contract.

11. CHANGES

The Contractor and the City agree and acknowledge as a part of this Contract that no change order or other form or order or directive may be issued by the City which requires additional compensable work to be performed, which work causes the aggregate amount payable under the Contract to exceed the amount appropriated for this Contract as listed above, unless the Contractor has been given a written assurance by the City that lawful appropriations to cover the costs of the additional work have been made or unless such work is covered under a remedy-granting provision of this Contract. The Contractor and the City further agree and acknowledge as a part of this Contract that no change order or other form or order or directive which requires additional compensable work to be performed under this Contract shall be issued by the City unless funds are available to pay such additional costs, and, regardless of any remedy-granting provision included within this Contract, the Contractor shall not be entitled to any additional compensation for any change which increases or decreases the Contract completion date, or for any additional compensable work performed under this Contract, and expressly waives any rights to additional compensation, whether by law or equity, unless, prior to commencing the additional work, the Contractor is given a written change order describing the change in Contract completion date or the additional compensable work to be performed, and setting forth the amount of compensation to be paid, and such change order is signed by the authorized City representative, as defined below. The amount of compensation to be paid, if any, shall be deemed to cover any and all additional, direct, indirect or other cost or expense or profit of the Contractor whatsoever. It is the Contractor's sole responsibility to know, determine, and ascertain the authority of the City representative signing any change order under this Contract.

No change, amendment, or modification to this Contract shall be valid unless duly approved and issued in writing by the City of Colorado Springs Procurement Services Division. The City shall not be liable for any costs incurred by the Contractor resulting from work performed for changes not issued in writing by the City of Colorado Springs Procurement Services Division.

The following personnel are authorized to sign changes, amendments, or modifications to this Contract.

The Project Manager: Changes up to $14,999.99
The City of Colorado Springs Chief of Staff: Changes up to $499,999.99
The Mayor of the City of Colorado Springs: Unlimited

12. ECONOMIC PRICE ADJUSTMENT

A. The Contractor shall notify the City of Colorado Springs Procurement Services Division if, at any time during contract performance, the rate of pay for labor or the unit prices for material shown in Schedule A experiences a significant increase. A change in price shall be considered significant when the unit price of an item increases by 10% from the execution date of this Contract. The Contractor shall furnish notice of this increase within 60 days after the increase, or within any additional period that the City Procurement Services Division may approve in writing, but not later than the date of final payment under this Contract. The notice shall include the Contractor's proposal for an adjustment in the Contract unit prices to be negotiated under paragraph (b) of this clause, and shall include, in the form required by the City Procurement Services Division, supporting data explaining the cause, effective date, and amount of the increase and the amount of the Contractor's adjustment proposal.

B. Promptly after the City Procurement Services Division receives the notice and data under paragraph (a) of this clause, the City Procurement Services Division and the Contractor shall negotiate a price adjustment in the contract unit prices and its effective date. However, the City Procurement Services Division may postpone the negotiations until an accumulation of increases in the labor rates (including fringe benefits) and unit prices of material shown in Schedule A results in an adjustment allowable under paragraph (c)(3) of this clause. The City Procurement Services Division shall modify this contract (1) to include the price adjustment and its effective date and (2) to revise the labor rates (including fringe benefits) or unit prices of material as shown in Schedule A to reflect the increases resulting from the adjustment. The Contractor shall continue performance at current rates pending agreement on, or determination of, any adjustment and its effective date.

C. Any price adjustment under this clause is subject to the following limitations:
   1. Any adjustment shall be limited to the effect on unit prices of the increases in the rates of pay for labor (including fringe benefits) or unit prices for material shown in Schedule A. There shall be no adjustment for:
      (i) Supplies or services for which the production cost is not affected by such changes;
      (ii) Changes in rates or unit prices other than those shown in Schedule A; or
      (iii) Changes in the quantities of labor or material used from those shown in Schedule A for each item.
   2. No upward adjustment shall apply to supplies or services that are required to be delivered or performed before the effective date of the adjustment, unless the Contractor's failure to deliver or perform according to the delivery schedule results from causes beyond the Contractor's control and without its fault or negligence, within the meaning of the Default clause.

3. There shall be no adjustment for any change in rates of pay for labor (including fringe benefits) or unit prices for material which would not result in a net change of at least 3 percent of the then-current total contract price. This limitation shall not apply, however, if, after final delivery of all line items, either party requests an adjustment under paragraph (b) of this clause.
4. The aggregate of the increases in any contract unit price made under this clause shall not exceed 10 percent of the original unit price.

13. ASSIGNMENT

No assignment or transfer by the Contractor of this Contract or any part thereof or of the funds to be received thereunder by the Contractor will be recognized unless such assignment has had the prior written approval of the City and the surety has been given due notice of such assignment. Such written approval by the City shall not relieve the Contractor of the obligations under the terms of this Contract. In addition to the usual recitals in assignment contracts, the following language must be included in the assignment:

It is agreed that the funds to be paid to the assignee under this assignment are subject to a prior lien for services rendered or materials supplied for the performance of the work called for in said contract in favor of all persons, firms, or corporations rendering such services or supplying such materials.

14. CHOICE OF LAW

This Contract is subject to and shall be interpreted under the law of the State of Colorado, and the Charter, City Code, Ordinances, Rules and Regulations of the City of Colorado Springs, Colorado, a Colorado home rule city. Court venue and jurisdiction shall be exclusively in the Colorado District Court for El Paso County, Colorado. The Parties agree that the place of performance for this Contract is deemed to be in the City of Colorado Springs, El Paso County, State of Colorado. The Contractor shall ensure that the Contractor and the Contractor's employees, agents, officers and subcontractors are familiar with, and comply with, applicable Federal, State, and Local laws and regulations as now written or hereafter amended.

15. WORKERS' COMPENSATION INSURANCE

Contractor shall take out and maintain during the Period of Performance, Colorado Worker's Compensation Insurance for the Contractor and all employees of the Contractor. If any service is sublet by the Contractor, the Contractor shall require the subcontractor to provide the same coverage for the subcontractor and subcontractor's employees. Workers' Compensation Insurance shall include occupational disease provisions covering any obligations of the Contractor in accord with the provisions of the Workers' Compensation Act of Colorado.

16. INDEMNIFICATION

Contractor agrees that the Contractor shall indemnify, defend and hold harmless the City, its officers, employees and agents, from and against any and all loss, damage, injuries, claims, cause or causes of action, or any liability whatsoever resulting from, or arising out of, or in connection with the Contractor's obligations or actions under this Contract caused by any willful or negligent error, omission or act or a failure to observe any applicable standard of care by the Contractor or any person employed by it or anyone for whose acts the Contractor is legally liable. In consideration of the award of this Contract, to the extent damages are covered by insurance,

the Contractor agrees to waive all rights of subrogation against the City, its subsidiary, parent, associated and/or affiliated entities, successors, or assigns, its elected officials, trustees, employees, agents, and volunteers for losses arising from the work performed by the Contractor for the City. The indemnification obligation shall survive the expiration or termination of this Contract.

17. INDEPENDENT CONTRACTOR

In the performance of the Contractor's obligations under this Contract, it is understood, acknowledged and agreed between the parties that the Contractor is at all times acting and performing as an independent contractor, and the City shall neither have nor exercise any control or direction over the manner and means by which the Contractor performs the Contractor's obligations under this Contract, except as otherwise stated within the Contract terms. The City shall not provide any direction to the Contractor on the work necessary to complete the project. Contractor understands that it is an independent contractor responsible for knowing how to perform all work or tasks necessary to complete project. The Contractor understands and agrees that the Contractor and the Contractor's employees, agents, servants, or other personnel are not City employees. The Contractor shall be solely responsible for payment of salaries, wages, payroll taxes, unemployment benefits or any other form of compensation or benefit to the Contractor or any of the Contractor's employees, agents, servants or other personnel performing services or work under this Contract, whether it is of a direct or indirect nature. Further in that regard, it is expressly understood and agreed that for such purposes neither the Contractor nor the Contractor's employees, agents, servants or other personnel shall be entitled to any City payroll, insurance, unemployment, worker's compensation, retirement or any other benefits whatsoever.

18. APPLICABLE LAW AND LICENSES

In the conduct of the services or work contemplated in this Contract, the Contractor shall ensure that the Contractor and all subcontractors comply with all applicable state, federal and City and local law, rules and regulations, technical standards or specifications. The Contractor shall qualify for and obtain any required licenses prior to commencement of work.

19. PRIOR AGREEMENTS

This is a completely integrated Contract and contains the entire agreement between the parties. Any prior written or oral agreements or representations regarding this Contract shall be of no effect and shall not be binding on the City. This Contract may only be amended in writing, and executed by duly authorized representatives of the parties hereto.

20. INTELLECTUAL PROPERTY

The Parties hereby agree, and acknowledge, that all products, items writings, designs, models, examples, or other work product of the Contractor produced pursuant to this Contract are works made for hire, and that the City owns, has, and possesses any and all ownership rights and interests to any work products of the Contractor made under this Contract, including any and all copyright, trademark, or patent rights, and that compensation to the Contractor for Agreement and acknowledgment of this intellectual property right section of this Contract is included in any compensation or price whatsoever paid to the Contractor under this Contract. It is the intent of the parties that the City shall have full ownership and control of the Contractor's work products produced pursuant to this Contract, and the Contractor specifically waives and assigns to the City all rights which Contractor may have under the 1990 Visual Artists Rights Act, federal, and state

law, as now written or later amended or provided. In the event any products, items writings, designs, models, examples, or other work product produced pursuant to this Contract is deemed by a court of competent jurisdiction not to be a work for hire under federal copyright laws, this intellectual property rights provision shall act as an irrevocable assignment to the City by the Contractor of any and all copyrights, trademark rights, or patent rights in the Contractor's products, items writings, designs, models, examples, or other work product produced pursuant to this Contract, including all rights in perpetuity. Under this irrevocable assignment, the Contractor hereby assigns to the City the sole and exclusive right, title, and interest in and to the Contractor's products, items writings, designs, models, examples, or other work product produced pursuant to this Contract, without further consideration, and agrees to assist the City in registering and from time to time enforcing all copyrights and other rights and protections relating to the Contractor's products, items writings, designs, models, examples, or other work product in any and all countries. It is the Contractor's specific intent to assign all right, title, and interest whatsoever in any and all copyright rights in the Contractor's products, items writings, designs, models, examples, or other work product produced pursuant to this Contract, in any media and for any purpose, including all rights of renewal and extension, to the City. To that end, the Contractor agrees to execute and deliver all necessary documents requested by the City in connection therewith and appoints the City as Contractor's agent and attorney-in-fact to act for and in Contractor's behalf and stead to execute, register, and file any such applications, and to do all other lawfully permitted acts to further the registration, prosecution, issuance, renewals, and extensions of copyrights or other protections with the same legal force and effect as if executed by the Contractor; further, the parties expressly agree that the provisions of this intellectual property rights section shall be binding upon the parties and their heirs, legal representatives, successors, and assigns.

21. WAIVERS

No waiver of default by the City of any of the terms, covenants, and conditions hereof to be performed, kept, and observed by the Contractor shall be construed, or shall operate, as a waiver of any subsequent default of any of the terms, covenants, or conditions herein contained to be performed, kept, and observed by the Contractor.

22. THIRD PARTIES

It is expressly understood and agreed that enforcement of the terms and conditions of this Contract, and all rights of action relating to such enforcement, shall be strictly reserved to the Parties hereto, and nothing contained in this Contract shall give or allow any such claim or right of action by any other or third person or entity on such Contract. It is the express intention of the Parties hereto that any person or entity, other than the Parties to this Contract, receiving services or benefits under this Contract shall be deemed to be incidental beneficiaries only.

23. TERMINATION

A. Termination for Convenience.

By signing this Contract, Contractor represents that it is a sophisticated business and enters into the Contract voluntarily, has calculated all business risks associated with this Contract, and understands and assumes all risks of being terminated for convenience, whether such risks are known or not known. Contractor agrees that the City may terminate this Contract at any time for convenience of the City, upon written notice to the Contractor. Contractor expressly agrees to and assumes the risk that the City shall not be liable for any costs or fees of whatsoever kind and

nature if termination for convenience occurs before Contractor begins any work or portion of the work. Contractor further expressly agrees and assumes the risks that the City shall not be liable for any unperformed work, anticipated profits, overhead, mobilizations costs, set-up, demobilization costs, relocation costs of employees, layoffs or severance costs, administrative costs, productivity costs, losses on disposal of equipment or materials, cost associated with the termination of subcontractors, costs associated with purchase orders or purchases, or any other costs or fees of any kind and nature, if Contractor has started or performed portions of the Contract prior to receiving notice from the City. The City shall be liable only for the portions of work Contractor actually satisfactorily completed up to the point of the issuance of the Notice of Termination for convenience. Upon receipt of this notice the Contractor shall immediately: discontinue all services affected (unless the notice directs otherwise), and deliver to the City all data, drawings, specifications, reports, estimates, summaries, and other information and materials accumulated in performing this Contract, whether completed or in process.

B. Termination for Cause: The occurrence of any one or more of the following events ("Event of Default") will justify termination for cause:

1. Contractor's failure to perform the work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule as adjusted from time to time.
2. Contractor's disregard of the laws or regulations of any public body having jurisdiction.
3. Contractor's disregard of the authority of Project Manager.
4. Contractor's violation in any material provision of the Contract Documents.
5. Contractor's failure to make prompt payments to its subcontractors, and suppliers of any tier, or laborers or any person working on the work by, through, or under the Contractor or any of them, any all of their employees, officers, servants, members, and agents.
6. Contractor files a petition commencing a voluntary case under the U.S. Bankruptcy Code, or for liquidation, reorganization, or an arrangement pursuant to any other U.S. or state bankruptcy Laws, or shall be adjudicated a debtor or be declared bankrupt or insolvent under the U.S. Bankruptcy Code, or any other federal or state laws relating to bankruptcy, insolvency, winding-up, or adjustment of debts, or makes a general assignment for the benefit of creditors, or admits in writing its inability to pay its debts generally as they become due, or if a petition commencing an involuntary case under the U.S. Bankruptcy Code or an answer proposing the adjudication of Contractor as a debtor or bankrupt or proposing its liquidation or reorganization pursuant to the Bankruptcy Code or any other U.S. federal or state bankruptcy laws is filed in any court and Contractor consents to or acquiesces in the filing of that pleading or the petition or answer is not discharged or denied within sixty (60) Calendar Days after it is filed.
7. A custodian, receiver, trustee or liquidator of Contractor, all or substantially all of the assets or business of Contractor, or of Contractor's interest in the Work or the Contract, is appointed in any proceeding brought against Contractor and not discharged within sixty (60) Calendar Days after that appointment, or if Contractor shall consent to or acquiesces in that appointment.
8. Contractor fails to commence correction of defective work or fails to correct defective work within a reasonable period of time after written notice.

If one or more of the events identified in Paragraphs 1-8 above occur, City may give Contractor written notice of the event and direct the event be cured. Any such Notice to Cure will provide Contractor a minimum of ten (10) calendar days to prepare and submit to the Project Manager a plan to correct the Event of Default. If such plan to correct the Event of Default is not submitted to the Project Manager within ten (10) days after the date of the written notice or

such plan is unacceptable to the City, the City may, give Contractor (and the Surety, if any) written notice that Contractor's services are being terminated for cause. Upon delivery of the termination notice, City may terminate the services of Contractor in whole or in part, exclude Contractor from the site, and take possession of the work and of all Contractor's tools, appliances, construction equipment, and machinery at the project site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion), incorporate in the work all materials and equipment stored at the site or for which City has paid Contractor but which are stored elsewhere, and finish the work as City may deem expedient. In such case, Contractor shall not be entitled to receive any further payment until Certificate of Completion of the work. In the event City terminates this Contract for Cause and the cost of completing the work exceeds the unpaid balance of the Contract price, Contractor shall pay City for any costs of completion which exceed the Contract price when combined with all amounts previously paid to Contractor. When exercising any rights or remedies under this paragraph City shall not be required to obtain the lowest price for the work performed. Should the cost of such completion, including all proper charges, be less than the original Contract price, the amount so saved shall accrue to the City. Neither the City nor any officer, agent or employee of the City shall be in any way liable or accountable to the Contractor or the Surety for the method by which the completion of the said work, or any portion thereof, may be accomplished or for the price paid.

Where Contractor's services have been so terminated by City, the termination will not affect any rights or remedies of City against Contractor or Surety then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by City will not release Contractor from liability.

C. Termination Notice. Upon receipt of a termination notice, whether for convenience or cause, the Contractor shall immediately: discontinue all services affected (unless the notice directs otherwise), and deliver to the City all data, drawings, specifications, reports, estimates, summaries, and other information and materials accumulated in performing this Contract, whether completed or in process.

D. Removal of Equipment. Except as provided above, in the case of termination of this Contract before completion from any cause whatever, the Contractor, if notified to do so by the City, shall promptly remove any part or all of Contractor's equipment and supplies from the property of the City, failing which the City shall have the right to remove such equipment and supplies at the expense of the Contractor.

24. BOOKS OF ACCOUNT AND AUDITING

The Contractor shall make available to the City if requested, true and complete records, which support billing statements, reports, performance indices, and all other related documentation. The City's authorized representatives shall have access during reasonable hours to all records, which are deemed appropriate to auditing billing statements, reports, performance indices, and all other related documentation. The Contractor agrees that it will keep and preserve for at least seven years all documents related to the Contract which are routinely prepared, collected or compiled by the Contractor during the performance of this Contract.

The City's Auditor and the Auditor's authorized representatives shall have the right at any time to audit all of the related documentation. The Contractor shall make all documentation available for examination at the Auditor's request at either the Auditor's or Contractor's offices, and without expense to the City.

25. COMPLIANCE WITH IMMIGRATION REFORM AND CONTROL ACT OF 1986

Contractor certifies that Contractor has complied with the United States Immigration Reform and Control Act of 1986. All persons employed by Contractor for performance of this Contract have completed and signed Form I-9 verifying their identities and authorization for employment.

26. LABOR

The Contractor shall employ only competent and skilled workmen and foremen in the conduct of work on this Contract. The Contractor shall at all times enforce strict discipline and good order among Contractor's employees. The Project Manager shall have the authority to order the removal from the work of any person, including Contractor's or any subcontractor's employees, who refuses or neglects to observe any of the provisions of these Plans or Specifications, or who is incompetent, abusive, threatening, or disorderly in conduct and any such person shall not again be employed on the Project.

In accord with the Keep Jobs in Colorado Act, codified at sections 8-17-101, et seq., C.R.S., Colorado labor shall be employed to perform the work to the extent of not less than eighty percent (80%) of each type or class of labor in the several classifications of skilled and common labor employed on this Project et seq.=; provided however, that this paragraph shall not apply if the Project receives federal funding.

In no event shall the City be responsible for overtime pay.

27. GRATUITIES

A. This Contract may be terminated if the Mayor, the Mayor's designee, and/or the Procurement Services Manager determine, in their sole discretion, that the Contractor or any officer, employee, agent, or other representative whatsoever, of the Contractor offered or gave a gift or hospitality to a City officer, employee, agent or Contractor for the purpose of influencing any decision to grant a City contract or to obtain favorable treatment under any City contract.

B. The terms "hospitality" and "gift" include, but are not limited to, any payment, subscription, advance, forbearance, acceptance, rendering or deposit of money, services, or anything of value given or offered, including but not limited to food, lodging, transportation, recreation or entertainment, token or award.

C. Contract termination under this provision shall constitute a breach of contract by the Contractor, and the Contractor shall be liable to the City for all costs of reletting the contract or completion of the project. Further, if the Contractor is terminated under this provision, or violates this provision but is not terminated, the Contractor shall be subject to debarment under the City's Procurement Regulations. The rights and remedies of the City provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Contract.

28. NON-DISCRIMINATION

A. In accordance with section 24-34-402, C.R.S., the Contractor will not discriminate against any employee or applicant for employment because of disability, race, creed, color, sexual orientation, religion, age, national origin, or ancestry. But, with regard to a disability, it is not a

discriminatory or an unfair employment practice for an employer to take into consideration disability if there is no reasonable accommodation that the employer can make with regard to the disability, the disability actually disqualifies the person from the job, and the disability has a significant impact on the job. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their disability, race, creed, color, sexual orientation, religion, age, national origin, or ancestry. Such actions shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training; including apprenticeship.

B. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

C. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to disability, race, creed, color, sexual orientation, religion, age, national origin, or ancestry.

D. Contractor will cooperate with the City in using Contractor's best efforts to ensure that Disadvantaged Business Enterprises are afforded the maximum opportunity to compete for subcontracts or work under this Contract.

29. ORDER OF PRECEDENCE

Any inconsistency in this Contract shall be resolved by giving precedence in the following order:

A. This Contract document with its terms and conditions
B. Specific Construction Terms and Conditions
C. General Construction Terms and Conditions
D. The Statement of Work
E. Specific Specifications
F. General Specifications
G. Other Appendices, Attachments, Exhibits, or Schedules

30. HEADINGS

The section headings contained in this Contract are for reference purposes only and shall not affect the meaning or interpretation of this Contract.

31. DISPUTES

A. All administrative and contractual disputes arising from or related to this Contract other than those arising under Unanticipated Circumstances provisions (in section107.27 of Schedule B General Construction Terms and Conditions) shall be addressed in the following manner:
    1. If either Party disputes or disagrees with a Contract term or the other Party’s interpretation of a Contract term or has any other administrative or contractual dispute not addressed in the Unanticipated Circumstances provisions, such Party shall promptly give the other Party written notice of said dispute.
    2. The Parties shall hold a meeting as soon as reasonably possible, but in no event later

than thirty (30) calendar days from the initial written notice of the dispute, attended by persons with decision-making authority regarding the dispute, to attempt in good faith to negotiate a resolution of the dispute; provided, however, that no such meeting shall be deemed to vitiate or reduce the obligations and liabilities of the Parties or be deemed a waiver by a Party of any remedies to which such Party would otherwise be entitled unless otherwise agreed to by the Parties in writing.

3. If, within thirty (30) calendar days after such meeting, the Parties have not succeeded in negotiating a resolution of the dispute, they agree to submit the dispute to non-binding mediation and to bear equally the costs of the mediation.
4. The Parties will jointly appoint a mutually acceptable mediator. If they fail to do so within twenty (20) calendar days from the conclusion of the negotiation period, they shall each select a mediator. The two mediators will then appoint a third mediator who shall conduct mediation for the Parties as the sole mediator.
5. The Parties agree to participate in good faith in the mediation and negotiations for a period of thirty (30) calendar days. The substantive and procedural law of the State of Colorado shall apply to the proceedings. If the Parties are not successful in resolving the dispute through mediation, then the Parties shall be free to pursue any other remedy afforded by the laws of the State of Colorado.
6. Until final resolution of any dispute hereunder, the Contractor shall diligently proceed with the performance of this Contract as directed by the City. For purposes of this Contract, termination for convenience shall not be deemed a dispute. The City of Colorado Springs and the Contractor agree to notify each other in a timely manner of any claim, dispute, or cause of action arising from or related to this Contract, and to negotiate in good faith to resolve any such claim, dispute, or cause of action. To the extent that such negotiations fail, the City of Colorado Springs and the Contractor agree that any lawsuit or cause of action that arises from or is related to this Contract shall be filed with and litigated only by the Colorado District Court for El Paso County, CO.

32. DELIVERY

The City may cancel this Contract or any portion thereof if delivery is not made when and as specified, time being of the essence in this Contract. Contractor shall pay the City for any loss or damage sustained by the City because of failure to perform in accordance with this Contract.

33. PAYMENTS

All invoices shall be sent to the Project Manager identified in this Contract.

The City will pay the Contractor, upon submission of proper invoices, the prices stipulated in the Contract for services rendered and accepted, less any deductions provided in this Contract within 30 days (Net 30). The City will not pay late fees or interest. Any discount payment terms offered on the invoice may be taken by the City.

All payments for Construction will be made in accordance with the Payment provisions found in Schedule B – General Construction Terms and Conditions.

Each invoice must contain at least the following information:

Contract number, issued purchase order number, invoice number, invoice date, timeframe covered by invoice, type and amount of labor and materials used for that time period, dollar amount in unit price, extended price, and total value of invoice.

34. INSPECTION OF SERVICES

The Contractor is responsible for performing or having performed all inspections and tests necessary to substantiate that the services furnished under this Contract conform to Contract requirements, including any applicable technical requirements for specified manufacturers' parts. This clause takes precedence over any City inspection and testing required in the Contract's specifications, except for specialized inspections or tests specified to be performed solely by the City.

A. Definition of "services", as used in this clause, includes services performed, workmanship, and material furnished or utilized in the performance of services.

B. The Contractor shall provide and maintain an inspection system acceptable to the City covering the services under this Contract. Complete records of all inspection work performed by the Contractor shall be maintained and made available to the City during Contract performance and for as long afterwards as the Contract requires.

C. The City has the right to inspect and test all services called for by the Contract, to the extent practicable at all times and places during the term of the Contract. The City will perform inspections and tests in a manner that will not unduly delay the work.

D. If the City performs inspections or test on the premises of the Contractor or a subcontractor, the Contractor shall furnish, and shall require subcontractors to furnish, at no increase in Contract price, all reasonable facilities and assistance for the safe and convenient performance of these duties.

35. SECURITY

The City maintains security requirements regarding access to City buildings and other City workplaces and worksites on City property. All Contractor personnel accessing City buildings, workplaces, or worksites, may be required to produce a valid, Government issued picture identification. Contractor personnel lacking such identification may not be allowed access to such sites. No costs incurred by the Contractor due to City security requirements shall be allowable or payable under this Contract.

36. TIME IS OF THE ESSENCE

In as much as the Contract concerns a needed or required service, the terms, conditions, and provisions of the Contract relating to the time of performance and completion of work are of the essence of this Contract. The Contractor shall begin work on the day specified and shall prosecute the work diligently so as to assure completion of the work within the number of calendar days or date specified, or the date to which the time for completion may have been extended.

37. EMPLOYMENT OF LABOR

The Contractor shall comply with, and defend and hold the City harmless from any violation of all laws and lawful rules and regulations, both of the State of Colorado and of the United States, relating to Workmen's Compensation, unemployment compensation, Social Security, payment for overtime, and all other expenses and conditions of employment under this Contract.

38. SALES TAX

The Contractor must have a tax-exemption certificate from the Colorado Department of Revenue for this project. The certificate does not apply to City of Colorado Springs Sales and Use Tax which shall be applicable. The tax exempt project number and the exemption certificate only applies to County, PPRTA (Pikes Peak Rural Transportation Authority), and State taxes when purchasing construction and building materials **to be incorporated into this project**.

Furthermore, the exemption **does not** include or apply to the purchase or rental of equipment, supplies or materials that **do not become a part of the completed project or structure**. Such purchases and rentals are subject to full applicable taxation.

All contracts with subcontractors must include the City of Colorado Springs Sales and Use Tax on the work covered by the Contract, and other taxes as applicable.

Note: For all equipment, materials and supplies incorporated into the work purchased from vendors or suppliers not licensed to collect City Sales Tax (i.e. out of state suppliers, etc.), City Use Tax is due and payable to the City. The Contractor shall execute and deliver, and shall cause the Contractor's subcontractors to execute and deliver to the City Sales Tax Office, ST 16 forms listing all said equipment, materials and supplies and the corresponding use tax due, along with payment for said taxes. Any outstanding taxes due may be withheld from the final payment due the Contractor and may result in suspension of Contractor from bidding on City projects.

Forms and instructions can be downloaded at https://coloradosprings.gov/cat/government/tax-information/sales-tax. Questions can be directed to the City Sales Tax Division at (719) 385-5903.

Our Registration Numbers are as follows:
City of Colorado Springs
Federal I.D.: 84-6000573
Federal Excise: A-138557
State Sales Tax: 98-03479

The Contractor's payment or exemption of State of Colorado, El Paso County and City Sales and Use Taxes shall be as specified herein.

39. SEVERABILITY

If any terms, conditions, or provisions of this Contract shall be held unconstitutional, illegal, or void, such finding shall not affect any other terms, conditions, or provisions of this Contract.

40. LIABILITY OF CITY EMPLOYEES

All authorized representatives of the City are acting solely as agents and representatives of the City when carrying out and exercising the power or authority granted to them under the Contract. There shall not be any liability on them either personally or as employees of the City.

41. USE OF CITY NAME OR LOGO

Except as otherwise provided in this Contract, the Contractor shall not refer to this Contract or the City of Colorado Springs in any advertising or promotions in such a manner as to state or imply

that the product or service provided is endorsed or preferred by the City of Colorado Springs, its employees, or its Departments, or is considered by these entities to be superior to other products or services. Any use of the name or logo of the City of Colorado Springs in advertising or promotions must be approved in writing by the City of Colorado Springs Contracts Specialist assigned to the Contract prior to such use.

42. TRAVEL

If travel expenses are included as a line item in this Contract, all travel expenses incurred and billable by the Contractor are subject to City approval. Air travel shall be limited to the round trip "economy coach" fare. Travel from the Colorado Springs Airport is encouraged. Unless there are extenuating circumstances, the Contract should take advantage of lower airfares by purchasing tickets more than 14 days in advance of travel. In-state travel by air must be more economical than travel by private vehicle. Use of a private vehicle may be reimbursed per mile at the current rate published by the IRS annually. Short-term parking, long-term parking or cab fare associated with airport departure and arrival may be allowable expenses. Valet parking will not be allowed unless it is the least expensive or only option. Car rental rates may be reimbursed for car rentals no greater than the intermediate or standard classification. The City will not reimburse any other travel methods or expenses. The City will pay for lodging, meals, and miscellaneous expenses on a per diem basis only, in accordance with the current per diem rates published by the IRS annually. The City will not pay for Contractor expenses exceeding the per diem rates. Receipts for all reimbursable expenses must be provided with the Contractor's invoice.

43. ELECTRONIC SIGNATURE

This Agreement and all other documents contemplated hereunder may be executed using electronic signature with delivery via facsimile transmission, by scanning and transmission of electronic files in Portable Document Format (PDF) or other readily available file format, or by copy transmitted via email, or by other electronic means and in one or more counterparts, each of which shall be (i) an original, and all of which taken together shall constitute one and the same agreement, (ii) a valid and binding agreement and fully admissible under state and federal rules of evidence, and (iii) enforceable in accordance with its terms

44. APPENDICES

The following Appendices are made a part of this Agreement:

1. Schedule A – Contractor's Bid
2. Schedule B – General Construction Terms and Conditions
3. Schedule C – Statement of Work
4. Schedule D – Special Provisions
5. Schedule E – Technical Specifications
6. Schedule F – Construction Plans
7. Schedule G – Stormwater Management Plan
8. Schedule H – Drainage Report
9. Schedule I – Grading & Erosion Control
10. Schedule J – Stockpile Stormwater Management Plan
11. Schedule K – Stockpile Grading & Erosion Control
12. Schedule L – Variance Letter
13. Schedule M – Minimum Insurance Requirements

CONTRACT SIGNATURE PAGE

IN WITNESS WHEREOF, the parties have caused these presents to be executed on the day and the year first above written.

This Contract is executed in one (1) original copy.

THE CITY OF COLORADO SPRINGS, COLORADO:	
MAYOR	**DATE**

SECOND PARTY:	
Corporate Name	
Signature	Date
Title	

EXHIBIT 2 – QUALIFICATION STATEMENT

This statement will provide information which will enable the City to evaluate the qualifications of your firm and staff with regard to the requirements of this Invitation for Bid. Please complete this form in its entirety and submit it (in the number of copies requested) along with the other required proposal documents. If a request in the Qualification Statement is contained in the Bid, indicate the section in the Bid where that information can be found.

(PRINT)
FIRM NAME: _____
ADDRESS: _____
CITY STATE ZIP: _____
AUTHORIZED REPRESENTATIVE: _____
TITLE: _____
AUTHORIZED SIGNATURE: _____
PHONE: _____ FAX: _____
E-MAIL ADDRESS: _____
1. TYPE OF BUSINESS _____
2. TYPE OF LICENSE AND LOCATION _____
CORPORATION ☐ INDIVIDUAL ☐
PARTNERSHIP ☐ JOINT VENTURE ☐
OTHER: _____

3. TYPE OF SERVICE TO BE PROVIDED FOR IFB: _____

4. NUMBER OF YEARS IN BUSINESS: _____

5. ON A SEPARATE SHEET PROVIDE A BRIEF HISTORY OF YOUR FIRM, STAFF SIZE AND EXPERIENCE. SUBMIT A RESUME FOR THE PROJECT MANAGER AND EACH KEY PERSONNEL ASSIGNED TO THIS PROJECT.

6. WHAT OTHER NAME(S) HAS YOUR COMPANY OPERATED UNDER:

7. HAVE YOU OR YOUR FIRM EVER FAILED TO COMPLETE ANY WORK AWARDED TO YOU? YES ☐ NO ☐ IF "YES", EXPLAIN:

8. HAS ANY OFFICER OR PARTNER OF YOUR ORGANIZATION EVER BEEN AN OFFICER OR PARTNER OF ANOTHER ORGANIZATION THAT FAILED TO COMPLETE A CONTRACT WITHIN THE LAST FIVE (5) YEARS? YES ☐ NO ☐
IF "YES", EXPLAIN:

9. HAS YOUR FIRM OR ANY PARTNERS OR OFFICERS EVER BEEN INVOLVED IN ANY BANKRUPTCY ACTION? YES ☐ NO ☐ IF "YES", EXPLAIN:

_____

_____

_____

_____

10. ARE YOU PRESENTLY INVOLVED IN ANY LITIGATION WITH ANY GOVERNMENT AGENCY? YES ☐ NO ☐ IF "YES", EXPLAIN TYPE, KIND, PLAINTIFF, DEFENDANT, ETC., AND STATE THE CURRENT STATUS:

_____

_____

_____

_____

11. BANK REFERENCE: _____

ADDRESS: _____

CONTACT: PHONE:

12. LIST THREE (3) SIMILAR PROJECTS (LOCAL OR STATE-WIDE) **FROM LAST FIVE (5) YEARS**-INCLUDE LOCATION OF PROJECT, SIZE OF PROJECT (CONTRACT AMOUNT), CONTACT NAME, ADDRESS, TELEPHONE NUMBERS

NOTE: DETAILED INFORMATION ON THESE PROJECTS MAY ALSO BE REQUESTED IN THE IFB PACKAGE.

1. Location of Project:
Size of Project:
Contract Amount:
Contact Name and Title:
Contract Address:
Contact telephone and FAX Numbers:

2. Location of Project:
Size of Project:
Contract Amount:
Contact Name:
Contact Address:
Contact telephone and FAX Numbers:

3. Location of Project:
Size of Project:
Contract Amount:
Contact Name:
Contact Address:
Contact telephone and FAX Numbers:

13. LIST **CURRENT** SIMILAR PROJECTS (LOCAL OR STATE-WIDE) UNDER CONTRACT-INCLUDE LOCATION OF PROJECT, SIZE OF PROJECT (CONTRACT AMOUNT) CONTACT NAME, ADDRESS, TELEPHONE NUMBERS.

NOTE: DETAILED INFORMATION ON THESE PROJECTS MAY ALSO BE REQUESTED IN THE IFB PACKAGE.

1. Location of Project:
Size of Project:
Contract Amount:
Contact Name and Title:
Contact Address:
Contact telephone and FAX Numbers:

2. Location of Project:
Size of Project:
Contract Amount:
Contact Name and Title:
Contact Address:
Contact telephone and FAX Numbers:

3. Location of Project:
Size of Project:
Contract Amount:
Contact Name and Title:
Contact Address:
Contact telephone and FAX Numbers:

14. LIST OF SUB-CONTRACTORS TO BE USED FOR THIS PROJECT:
(INCLUDE NAME, ADDRESS, TELEPHONE NUMBER, TYPE OF WORK)

1. Name:
Address:
Telephone Number:
Type of Work:

2. Name:
Address:
Telephone Number:
Type of Work:

3. Name:
Address:
Telephone Number:
Type of Work:

IF ADDITIONAL INFORMATION IS PROVIDED ON A SEPARATE SHEET FOR ANY OF THE ITEMS, CLEARLY SPECIFY WHERE IT CAN BE LOCATED IN YOUR BID PACKAGE.

EXHIBIT 3 – BID CERTIFICATION AND REPRESENTATIONS AND CERTIFICATIONS

Check or Mark the space after each number to indicate compliance.

1. _____ Address of Offeror's Principal Place of Business:

   _____

   _____

Does Offeror have an established office or facility in Colorado Springs?

Yes _____ No _____

If yes, indicate address below if different than Principal Place of Business.

Colorado Springs Facility - Year established _____

Address of Colorado Springs Facility:

_____

_____

Percent of Work to be Performed from Principal Place of Business? _____

Percent of Work to be Performed from Colorado Springs Facility? _____

2. _____ Indicate your ability to provide a certificate of insurance evidencing the required coverage types and limits specified in Minimum Insurance Requirements Exhibit. (The certificate of insurance must reflect the City of Colorado Springs as an Additional Insured, as applicable.)

Indicate your ability to comply with the following requirements:

The City shall be added as an Additional Insured to all liability policies:

Yes _____ No _____

Your property and liability insurance company is licensed to do business in Colorado:

Yes _____ No _____

Provide the name of your property and liability insurance company here:

Name: _____

Your property and liability insurance company has an AM best rating of not less than B+ and/or VII:

Yes _____ No _____

Worker's Compensation Insurance is carried for all employees and covers work done in Colorado:

Yes _____ No _____

3. _____ Provide one (1) copy of current financial statements (if required). Enclose financial information in a separate envelope; do not bind with the other proposal copies. If review of the information is to be restricted to the City's financial officer, it must be marked accordingly.

4. _____ Provide the completed and signed bid. (Bids must be identified as specified in this IFB document). All required Exhibits are attached.

By signing below, the Offeror certifies that no person or firm other than the Offeror or as otherwise indicated has any interest whatsoever in this offer or any Contract that may be entered into as a result of this offer and that in all respects the offer is legal and firm, submitted in good faith without collusion or fraud. The undersigned additionally declares that it has carefully examined the Bid information and the complete Solicitation prior to submitting a Bid. The Bidder's signature will be considered the Bidder's acknowledgement of understanding and ability to comply with all items in the solicitation.

Offeror has appointed _____ as the Offeror's representative and contact for all questions or clarifications in regard to this Offeror.

Telephone: (___) _____

Email: _____

The undersigned acknowledges and understands the terms, conditions, Specifications and all Requirements contained and/or referenced and are legally authorized by the Offeror to make the above statements or representations.

_____ _____
(Name of Company) (Signature)

_____ _____
(Address) Date

_____ _____
(City, State and Zip) (Telephone Number)

_____ _____
(Name typed/Printed) (Title)

_____
(E-Mail Address)

FEDERAL TAX ID #_____

This Company Is: Corporation___ Individual____ Partnership____ LLC____

Offeror hereby acknowledges receipt of the following amendments, if applicable. Offeror agrees that it is bound by all Amendments identified herein.

AMENDMENT #1_____ DATED:_____

AMENDMENT #2_____ DATED:_____

AMENDMENT #3_____ DATED:_____

Please Note: the following Representations and Certifications must be initialed by Offeror in the spaces provided and returned with this certification.

1. INSURANCE REQUIREMENTS

Offeror shall comply with all insurance requirements and will submit the Insurance Certificates prior to performance start date. If limits are different from the stated amounts, Offeror shall explain variance. Certain endorsements and "additionally insured" statements may require further clarification and specific statements on a project specific basis and should have been described in the Offeror's Bid.

_____
Initials for 1

2. ETHICS VIOLATIONS

A. The Offeror shall have in place and follow reasonable procedures designed to prevent and detect possible violations described in this clause in its own operations and direct business relationships.
B. Offeror certifies the Offeror has not violated or caused any person to violate, and shall not violate or cause any person to violate, the City's Code of Ethics contained in Article 3, of Chapter 1 of the City Code and in the City's Procurement Rules and Regulations
C. When the Offeror has reasonable grounds to believe that a violation described in this clause may have occurred, the Offeror shall promptly report the possible violation to the City Contracts Specialist in writing.
D. The Offeror must disclose with the signing of this Bid, the name of any officer, director, or agent who is also an employee of the City and any City employee who owns, directly or indirectly, an interest of ten percent (10%) or more in the Offeror's firm or any of its branches.
E. In addition, the Offeror must report any conflict or apparent conflict, current or discovered during the performance of the Contract, to the City Contracts Specialist.
F. The Offeror shall not engage in providing gifts, meals or other amenities to City employees. The right of the Offeror to proceed may be terminated by written notice issued by City Contracts Specialist if Offeror offered or gave a gratuity to an officer, official, or employee of the City and intended by the gratuity to obtain a contract or favorable treatment under a contract.
G. The Offeror shall cooperate fully with the City or any agency investigating a possible violation on behalf of the City. If any violation is determined, the Offeror will properly compensate the City.
H. The Offeror agrees to incorporate the substance of this clause (after substituting "Contractor" for "Offeror") in all subcontracts under this offer.

_____
Initials for 2

3. COOPERATION WITH OTHER CONTRACTORS

Other City activities/contracts may be in progress or start during the performance of this contract. The Offeror shall coordinate the work harmoniously with the other contractors or City personnel, if applicable.

_____
Initials for 3

4. INTERNET USE

Should the Offeror require access to City Internet resources in the performance of this requirement, a "Contractor's Internet Use Agreement" form must be separately signed by each individual having access to the City Network. The completed Contractor's Internet Use Agreement will be maintained with this agreement. Inappropriate use of the City Network will be grounds for immediate termination of any awarded contact.

_____

Initials for 4

5. LITIGATION

If awarded a contract, Offeror shall notify the City within five (5) calendar days after being served with a summons, complaint, or other pleading in any matter which has been filed in any federal or state court or administrative agency. The Offeror shall deliver copies of such document(s) to the City's Procurement Services Manager. The term "litigation" includes an assignment for the benefit of creditors, and filings of bankruptcy, reorganization and/or foreclosure.

_____

Initials for 5

6. CONTRACTOR'S REGISTRATION INFORMATION

Offeror's firm verifies and states that they are (check all that apply):

_____ Large Business (i.e. do not qualify as a small business or non-profit)

_____ Nonprofit

_____ Small Business

_____ Minority Owned Business/Small Disadvantaged Business

_____ Woman Owned Business

_____ Veteran Owned Business

_____ Service-Disabled Veteran Owned Business

_____ HUBZone Business

Note: The City accepts self-certification for these categories in accordance with Small Business Administration (SBA) standards. The SBA size standards are found on the SBA website https://www.sba.gov/content/am-i-small-business-concern.

_____
Initials for 6

7. CONTRACTOR PERSONNEL

A. The Offeror shall appoint one of its key personnel as the "Authorized Representative" who shall have the power and authority to interface with the City and represent the Offeror in all administrative matters concerning this Bid and any awarded contract, including without limitation such administrative matters as correction of problems modifications, and reduction of costs.
B. The Authorized Representative shall be the person identified in the Offeror's Bid, unless the Offeror provides written notice to the City naming another person to serve as its Authorized Representative. Communications received by the City Contracts Specialist from the Authorized Representative shall be deemed to have been received from the Offeror.

The individual, _____ (Name)
with position, _____ (Title)
Can be reached at
Work telephone number: _____

Home telephone number: _____
Cellular telephone number: _____
E-mail address: _____

_____
Initials for 7

8. OFFEROR's CERTIFICATION

The undersigned hereby affirms that:

A. He/She is a duly authorized agent of the Offeror;
B. He/She has read and agrees to the City's standard terms and conditions attached.
C. The offer is presented in full compliance with the collusive prohibitions of the City of Colorado Springs. The Offeror certifies that no employee of its firm has discussed, or compared the offer with any other offeror or City employee and has not colluded with any other offeror or City employee.
D. The Offeror certifies that it has checked all of its figures, and understands that the City will not be responsible for any errors or omissions on the part of the Offeror in preparing its Bid.
E. By submitting an offer the Offeror certifies that it has complied and will comply with all requirements of local, state, and federal laws, and that no legal requirements have been or will be violated in making or accepting this solicitation.
F. If awarded the contract, the Offeror agrees to execute and enter into a contract with the City, and furnish the necessary security within ten (10) days of receipt of the "Notice of Award:, and to begin the work within ten (10) day from the date of the receipt of the "Notice to Proceed", and to complete the Work with the above specifications.
G. I hereby certify that I am submitting the Bid based on my company's capabilities to provide quality products and/or services on time.

_____
Initials for 8

9. OFFEROR CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS:

A. The Offeror certifies to the best of its knowledge and belief, that (i) the Offeror and/or any of its Principals
    1. Are ( ), Are not ( ) presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;
    2. Have ( ), Have not ( ), within a three year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, local) contract or subcontract; violation of Federal or state antitrust statutes relation to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statement, tax evasion, or receiving stolen property; and
    3. Are ( ), Are not ( ) presently indicated for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in any paragraphs above.
B. The Offeror shall provide immediate written notice to the City Contracts Specialist if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reasons of changed circumstances.
C. The certification in paragraph 1. above, is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the City, the City Contracts Specialist may terminate the contract resulting from this solicitation for default. Termination for default may result in additional charges being levied for the costs incurred by the City to initiate activities to replace the awarded Contractor.

_____
Initials for 9

10. ACCEPTANCE OF CITY CONTRACTS SPECIALIST'S SOLE AUTHORITY FOR CHANGES

Unless otherwise specified in the Contract, the Offeror hereby agrees that any changes to the scope of work, subsequent to the original contract signing, shall be generated in writing and an approval signature shall be obtained from the City Contracts Specialist prior to additional work performance.

_____
Initials for 10

11. CITY CONTRACTOR SAFETY PROGRAM

The Offeror hereby agrees to adhere to a worker safety program for contractor employees on a City job site or location. By initialing below, the Offeror has reviewed the information and will abide by the City Policy which is available for review:

https://coloradosprings.gov/finance/page/procurement-regulations-and-documents

_____
Initials for 11

12. ACCEPTANCE OF CITY ENVIRONMENTALLY PREFERRED PURCHASING (EPP) POLICY

The City of Colorado Springs is committed to buying more environmentally preferable goods and services, as long as they meet performance needs, are available within a reasonable time and at a reasonable cost. The Offeror hereby acknowledges review of this policy by initialing below.

https://coloradosprings.gov/finance/page/procurement-regulations-and-documents

_____
Initials for 12

13. FRAUD, WASTE, AND ABUSE

Everyone has a duty to report any suspected unlawful act impacting the City of Colorado Springs operations and its enterprises. Anyone who becomes aware of the existence or apparent existence of fraud, waste, and abuse in City of Colorado Springs is encouraged to report such matters to the City Auditor's Office in writing or on the telephone hotline 385-2387 (ADTR). Written correspondence can be mailed to:

City Auditor
P.O. Box 2241
Colorado Springs CO 80901

Or via email FraudHotline@coloradosprings.gov. Any of these mechanisms allow for anonymous reporting. For more information, please go to the website https://coloradosprings.gov/cityfraud.

_____
Initials for 13

Name of Company: _____

Federal Tax ID Number: _____

DUNS Number: _____

Principal Place of Business: _____

_____
Signature of Authorized Representative

Printed Name:_____

Title:_____

Date:_____

EXHIBIT 4 – CITY OF COLORADO SPRINGS BID BOND

1. KNOW ALL MEN BY THESE PRESENTS, THAT:

_____
(Name)

_____ As Principal, hereinafter called Principal, and
(Address)

_____
(SURETY Name)

a corporation organized and existing under the laws of the State of:

_____
(SURETY Address)

and AUTHORIZED TO DO BUSINESS IN THE STATE OF COLORADO, as Surety, hereinafter called Surety, are held firmly bound to the CITY OF COLORADO SPRINGS, COLORADO, as Obligee, hereinafter called the Obligee, in the sum of: (Insert Bid Amount in Words)

($ DOLLARS),

lawful money of the United States of America, for payment of which sum well and truly to be made, the Principal and the Surety bind themselves, their heirs, executors, successors and assigns, jointly and severally, firmly by these presents.

2. WHEREAS, the Principal has submitted to the Obligee,

a contract bid dated the _____ day of _____ For the following contract:

_____

3. NOW THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT, If Principals bid is accepted by Obligee and Principal is awarded the contract in whole or in part, and the Principal shall enter into the contract with the Obligee in accordance with the terms of such bid, and give such Payment, Performance, and Maintenance bond or bonds as may be specified in the bidding or contract documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such contract and give such bond or bonds, if the Principal shall promptly pay to the Obligee the amount of this bond as set forth herein above, then this obligation shall be null and void, otherwise this obligation to remain in full force and effect.

Signed and sealed on the dates set forth below:

_____ FOR: _____
(Witness) (Principals Name)

BY: _____

ITS: _____

(Seal)

This _____ day of _____

_____ FOR: _____
(Witness) (Surety's Name)

BY: _____

ITS: _____

(Seal)

This _____ Day of _____

Bond # _____ This Bond __(is) __ (is not) a SBA Guaranteed Bond.